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TABLE OF CONTENTS

Sex Differences in a Negro Peasant Community; Montserrat, B.W.I.
THEODORA M. ABEL and RHODA METRAUX 127

An Experimental Analysis of the Relationship Between Stimulus Structure and Behavior on the Rorschach....E. EARL BAUGHMAN 134

Rorschach Signs of "Organicity": A Physiological Basis for Perceptual Disturbances.....HERBERT G. BIRCH and LEONARD DILLER 184

The Bender Visual Motor Gestalt Test as an Index of Emotional Disturbance in Children.....AILEEN CLAWSON 198

The Influences of Color, Shading, and Welsh Anxiety Level on Elizur Rorschach Content Test Analyses of Anxiety and Hostility,
RALPH P. FORSYTH 207

Rorschach Schizophrenic Score (RSS).....[illegible] 214

A Case Illustrating the Concept of the Alpha Schizophrenic,
ZYGMUNT A. PIOTROWSKI and DAVID LEVINE 223

A Developmental Study of Sexual Functioning as Means of a Cognitive Analysis.....ELSIE MARIE SJOSTEDT and IRVING HERWITZ 237

Book Reviews 247

General Newsletter 251

Announcements 253

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Sex Differences in a Negro Peasant Community; Montserrat, B. W. I.[1]

THEODORA M. ABEL
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Projective tests have been found to be useful tools in investigating the personality structure and psychodynamics of individuals in cultural as well as in clinical settings. They supplement and complement the work of the cultural anthropologist in his study of personality in culture. Not only do these projective tests yield information about a cultural group under investigation but they also are effective in differentiating subgroups within a given culture and in highlighting individual differences (1).

In our study of Danio Village, a small mountain community of about 500 peasants on the island of Montserrat, British West Indies, the psychologist administered projective tests (Pfister Pyramid, Lowenfeld Mosaic, Szondi, Rorschach, and Cards 2, 4, 8 of the Baron Series[2]) to a sampling of the population; 34 males, 33 females, between the ages of 14 and 70[3]. In two previous publications resulting from this investigation we focused in the one case on intra-group variation of test responses and extent of formal education among adolescents (2), and in the other on a comparison of test results of individuals selected as deviant either by the test material, by the anthropologist, or by the community itself (9). In the present paper we shall discuss sex differences as reflected in projective material, and shall suggest what these differences might signify dynamically both from the point of view of the psychologist who administered the tests and the anthropologist who observed and interrogated the inhabitants during her field study.

Montserrat, the island on which our subjects lived, is part of the Leeward Islands Colony, and has a history of over 300 years of British government. The island is small and exceedingly rugged, and has a crowded population of some 14,000 persons—most of them peasants—sharecroppers, renters, hired laborers, small landowners, artisans, part-time fishermen, who are the colored descendants of Negro slaves imported to work the plantations. Most people—estate owners and peasants—grow Sea Island cotton, a crop with poor and uncertain cash returns; and outside government, there are few opportunities, aside from a few clerical jobs and some manual labor on roads and buildings, for work except on the land. Many men and women have been abroad—to other islands, to the Canal Zone, to the United States—and directly and indirectly Montserratians are affected not only by British, but also by American culture. They speak a dialect, locally known as "bad English," which is merging with the speech of educated British West Indians. Individualistically independent in their personal lives, they have up to now been without responsibility for their own welfare; in their view, Govern-

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[1] Paper read at the Fifth Inter-American Congress of Psychology, Mexico City, 1957. The field work on which this paper is based was supported by grants to the anthropologist by the Social Science Research Council, and to both field workers by the Institute for Intercultural Studies.

[2] These 3 cards were used to elicit human movement responses (4).

[3] A smaller number of people were also given a second Szondi, Bender Gestalt, Caligor Eight Card Re-Drawing, Horn-Hellersberg Drawing Completion, and Stewart Ring Puzzle. In addition, a small collection was made of free drawings by children and adults. The results of these tests, as well as the Pfister Pyramid, are not included in the present paper.

ment and "the higher people" both "keep us down" and "ought to do something."

Although few people in the village studied were analphabetic, few were comfortably literate, and these were scattered among the old and the young generations. Most people had been to school at some time, briefly or for a few years. A few stay until they are fifteen, the school-leaving age. In very recent years, it has been possible for an intelligent and ambitious child to transfer, with or without a scholarship, to the secondary school in town; but children are likely to leave school when they are eleven or twelve, after several years of irregular attendance and without completing more than three or four of the seven standard forms of elementary schooling[4].

This is the background of our test subjects, male and female, of Danio Village. The tests on which we are basing our discussion of sex differences are mainly the Szondi and the Rorschach. The Pyramid Test and the Mosaic reflect no detectable sex differences. But, as further background for our sex comparisons, we want to present a few results of the projective testing that suggest some of the characteristics of the sample population regardless of age or sex[5]. In the first place, these people reveal a strong dependency need to be looked after and cherished. That this need is one of oral deprivation is indicated by the references in the Rorschach to animals seeking or striving to get food. For example, there are such responses as rat, bat, or hawk "after something" (usually described as prey or food); a bird sitting under a fruit tree; a bird pecking at a fruit; a tiger after his dinner; a baby mouse up against its mother; two characters trying to lift potatoes. This need is pervasive, but it is one that is apparently not consciously acceptable. On the Szondi, the m factor is largely minus (among 65 subjects, male and female, 55 (84.5%) give a minus m). It is denied, presumably because the peasants of Danio Village have not been able to count on others, i.e., parents, to give them sufficient and consistent sustenance—food and cherishing—during their growing-up period. They must have had to, and still have to, shift for themselves in a more or less unsuccessful way. We shall discuss this point more at length when we make sex comparisons.

The ego structure suggested by the predominant Szondi responses of minus k and, particularly, minus p, is that of individuals who are oriented concretely to the external world, with little or no insight into motivational sources of action. Among the 65 subjects, 78% give minus p, while 54% respond by minus k. Forty-two percent have a minus k, minus p profile; 21% have a plus k, minus p; and 12% give open k with minus p. These profiles of consistent minus p, with predominantly minus k suggest that the stage of ego development of these people remains at the early latency period in the child, and one that is commonly found in an average population generally wherever the Szondi test has been given. At this stage the child or adult is convinced that his actions are determined by the objective character of his environment. He is not entangled in personal emotional relationships; and is more likely to be interested primarily in manipulating concrete objects[6].

Another characteristic of these people is that they are not repressed; they have outlets for their feelings and can drain off their more violent emotions. The low plus e on the Szondi, with predominant open e (only 15% give plus e, 29% minus e, and 40% open e), as well as the ability to use color both on the Mosaic and Rorschach,

[4] For more complete material on Montserrat, and on Danio Village, in particular, see (7, 8, 9).

[5] The Rorschach protocols of our sample population of 65 subjects will be available in a forthcoming volume of *Primary Records in Culture and Personality*. Bert Kaplan (Ed.) The Microcard Foundation, Madison, Wisconsin.

[6] Deri (5) p. 226.

support this view. On the Mosaic, all colors are employed rather frequently in making designs; forty-seven out of 64 subjects, or 73.4%, use all six colors in doing their task. On the Rorschach, nearly all subjects respond to color (FC or CF). Out of 65 subjects, only six males and six females give no color response. Color is generally expressed by some concept with a pleasantly toned aspect, i.e., wedding cake, fruit tree, flower garden, landscape, colored rocks in the sea, colored print for dress. This suggests that these people can be stimulated by, and are able in some fashion to relate to, the world around them, on a positive feeling basis. We can perhaps say that, although they are somewhat aloof (strong minus m on the Szondi), they have at least the possibility of feeling friendly toward others.

When we come to the sex differences, there are two characteristics shown by the women on the projective tests that are not shown by the men to any appreciable degree. These differences are indicated on the Szondi by the presence of a greater loading of plus d in the case of the women, and on the Rorschach, by a greater frequency of human movement (M) on the part of the women as compared to the men. On the Szondi, 61% of the females give plus d, while only 41% of the men do so. Also, women give a greater number of plus d choices than do the men. In the association between sex and height of plus score on the d factor, the X^2 is 5.5940, giving a probable error of $P<.02>.01$.

This loading of d plus suggests that although the women, like the men, deny their dependency needs on people (minus m), they accept and cling to objects (plus d). They must set some value on the material things around them, such as their houses, utensils, clothes, etc., and must strive to hold on to what they have. A plus d in isolation, of course, points to miserliness, but here it is accompanied by compensatory features such as a very high h plus, indicating acceptance of tender feelings (h plus given by 100% of the females and 91% of the males), and by pleasantly toned color responses on the Rorschach, as well as by the presence of human movement to be described below. Thus, we can suggest that the clinging to objects (plus d) is an asset, and adds a meaning and focus to the lives of these women.

The total number of Rorschach responses (R) of both men and women is small (average 13.45, SD 2.6854), and the human movement answers are limited—only one or two at most. But 64% of the women see human movement, whereas only 27% of the men do so. This difference is reliable statistically in the association of sex and number of M responses (X^2 equals 6.9780, $P<.01$)[7]. Hence, it appears that the women can make more use of their phantasy life, can employ creative imagination to some degree, and can in some way develop some inner resources. By so doing, they stabilize their relationship to their environment and to people somewhat better than do the men. Furthermore, the kinds of human movement seen are not limited to what is called "submission" (flexor movement), or "aggression" (extensor movement), but movement is described in a variety of ways: people or "Jumbies" are seen dancing, pulling, fighting, talking, boxing, "consulting", praying, kissing[8]. This suggests that the women are able to play some sort of adaptive role to others, and may act appropriately in different settings. They can "consult" (talk), they can argue and bicker, they can pray, they can show tender feelings, and can also express displeasure. They seem to be adaptable. Men appear more aloof and disagreeable (minus m on the Szondi with no accompanying plus d, and much less human movement on the Rorschach).

Adolescents of both sexes (C.A. 14-19), respond more frequently to shad-

[7] X^2 with Yates correction for small groups.

[8] Baron cards, as well as Rorschach, yielded these varied responses.

ing (c) than do the adults, male and female[9]. In the association between presence or absence of shading response and age group, X^2 equals 9.465 $P < .01$. This suggests adolescents have more anxiety than do the adults, and are less resigned to their lot in life. Since the group, as a whole, seems able to siphon off feelings (open e and use of color on the Rorschach), the shading differences do not appear to be due to repression. It indicates the adolescents have more problems to cope with and are less able to solve them than the adults.

However, it is our impression, from the projective material, that the adolescent girls are better able than the boys to handle their anxieties. We have only slight indications of this. In the first place, 10 out of 12 girls give plus s on the Szondi. This is not the pattern of the women; since only 3 out of 19 give a plus s factor, the remainder being distributed in the patterns of 11 zero, 2 minus, and 3 loaded s. The girls, then, are able to do something about their needs—presumably, their sexual and aggressive ones—by facing and fighting for what they want. The boys and the men also do this (28 out of 34 give a plus s). But, among the boys there is an indication that their need to assert themselves is beset with difficulties. The content of the Rorschach gives hints in this direction. For example, in the protocols of 8 of the 17 boys, there is at least one reference to a broken or mutilated object or plant, i.e., "squashed cristofine," "broken cotton plant," "tree torn by wind," "scorched grass." Two older men and 4 older women (over 40 years old) have such concepts, but no adolescent girl, younger woman, or younger man does. Also, among the adolescents, of particular frequent occurrence are references to some person or animal attacking or scaring someone, such as "man shooting gun," "evil hawk gets something," "Jumbie there to scare." Although these responses are found to some extent among all the sample male and female, 8 boys and 2 men give 8 or more descriptions of this kind in their record.

Hence, it looks as though the boys have anxiety about being able to assume their sexual role without danger or fear of failing. Like their fathers, the boys give a strong plus s on the Szondi, so that there seems to be no question of the repression of sex feelings, nor of identification with women. They can play the masculine role, but are struggling hard to find a place for themselves in this role. Like the men, they do not have a focus to their lives but, in addition, they do not seem to be accepted by men. Adolescent girls, on the other hand, seem able to identify with their mothers (plus d Szondi, M on Rorschach), and are not repressed or traumatized about their sexual role.

There is one more difference between the men and women, as revealed by the projective material, although it is possible that this difference is partly brought about by the selection of subjects. Among the men, there appear to be more deviants than among the women. There are a few Rorschach records of men that look like records of what we might call psychotics, sexually deviant, or sociopathic, as well as one or two cases of exceedingly secure and balanced individuals[10]. The records of the women vary, but not over such a wide range. Perhaps the males remaining in the community are not typical of all the males from the Island; or, it may be that the difficulties of living impose frustrations on the males that cannot be realistically solved.

Differences between sexes have been found in many studies of various cultural groups where projective techniques have been used. We need mention only two or three here. On the Island of Alor, in the East Indies, the women were found by Oberholzer (10) to reveal less intelligence than the

[9] c includes Klopfer K, k, c, except the FK vista.

[10] These deviants have been described in a previous publication (8).

men, but they showed greater industriousness, and their Rorschach records were more individualized. In Montserrat, the men's records are the more individualized; and we find no evidence of sex differences in intelligence and industriousness. On the Island of Truk, in Micronesia in the South Pacific, according to Sarason (6), the Rorschach and the Thematic Apperception Test revealed greater anxiety of all kinds on the part of the men as compared with the women; the women were more composed, at least outwardly, and felt more secure in confronting difficulties. The men were leaders and providers, but were prone to desperation and suicide in the face of frustration. The only similarity here, with the projective material from Montserrat, is in the women's greater adaptability to, and acceptance of, the requirements of given situations. The Montserrat men, however, are better off than the men on Truk, for they seem to be able to drain off their feelings more easily, and do not store up tension to the boiling point. (Color responses on Rorschach and open e on Szondi)

In the Village of Tepoztlàn, District of Morales, Mexico, a fair sampling of children and adults were given projective tests by Oscar Lewis and his wife. The psychologist of the present paper analyzed these results, in collaboration with Calabresi (3). In this group we found repression to be very severe. Little girls seemed to have little chance to show spontaneity and to enjoy themselves as did little boys. In adolescence, sex seemed to be taboo for girls. In adulthood, the young women seem submissive and fairly content, but older women were rigid, controlling, and bossy. The men, who appear to play the dominant role in their youth, gradually seemed to lose control as they advanced in years; older men seemed afraid of impotency, and were prone to outbursts of rage. For Danio Village, we did not make an analysis of the projective results on an age basis, so that our results cannot directly be compared. We can say this, however; that in both groups, the adolescent boys were particularly disturbed, whereas there was a great difference between the two groups of adolescent girls. In Tepoztlàn the girls were repressed and inhibited — particularly, sexually; in Montserrat they were more aggressive and more expansive in expressing their sexual needs.

The sex differences in various societies can be understood if the influences on the psychosocial development of the men and women are known. It is the job of the cultural anthropologist, working in collaboration with the psychologist who does the testing, to see just what forces are brought into play during the life cycle of the individual that may create the specific similarities and differences in the personality structure of the men and women as they function in their given society. We can suggest a few points that may possibly have affected the roles played by males and females in Danio Village.

In Montserrat, as on the other islands in the Caribbean culture areas, two forms of marital relationship are recognized: religiously sanctioned or civil marriage, and "keeping;" both of which may be enduring, and either of which can easily be broken off. Usually — but not inevitably — marriage follows on a period of trial "keeping." Children, even "wild bastards" born of a brief affair, are not stigmatized by being born out of wedlock; and are customarily given their father's surname, even if the parents do not live together[11].

Households are variously composed, but unless both parents are deceased or away, the chief responsibility for child rearing falls upon the parents, especially the mother. Grandparents, sisters, older siblings, friends may help

[11] Legally, of course, only the children of married couples bear their father's name. Customarily, if a child bears its mother's name, it is assumed either that the father could not be identified, or that it may be the child of an incestuous relationship.

out, but they are not recognized parental alternates. Thus, even for the child who has an adequate home, the phrase, "I am an orphan". (lacking father *or* mother), has a depth of meaning. At the same time, both men and women work outside the home—in their often distant gardens, in the cotton fields, or at some job near home, or sometimes off the island—and both set a very high value on personal autonomy, one symbol of which is having some money of one's own.

So, upon the mother falls a triple responsibility—for the welfare of her household, for the care of the children, and for maintaining her own security[12]. And the mother, caught between her desire to nurse her infant and care for her toddler successfully and responsibly, and to get on with her work, longs for and attempts to hasten the day when her young child stands on its own feet, eats ordinary food, and can join a group of free-ranging play fellows. For three or four months, she stays with the newborn infant, hoping it will learn to sleep quietly and to space out its feedings; later, when less help is forthcoming from others, she becomes restless and moves somewhat away from the child.

At five, children can be sent to school, if they can walk the necessary mile or two; but even earlier most of them reach a stage of self-sufficiency when, according to adults, "You can't stop them." Not the sex of the infant or small child, but its growing ability first to accept diminished care and later to fend for itself, are determining factors in the parents' ability to show affection and pride. The frail infant who cries and cannot sleep through the night without being fed; the small child whose development is slow—perhaps because of an ailment, as when a child has the yaws—may be cherished, but its mother's conflicting emotions keep the household in an ongoing state of disturbance; for her child's helpless dependence places her in a position of undesired dependence, as well[13].

Once they are on their feet and in school, relatively little is demanded of children save minimal obedience and respect for their elders. Although children perform some tasks—tethering the goats, fetching water, or leading the animals to water, or watching the house—much of what they do is voluntary (or is so phrased), and they are not regarded primarily as useful members of the household. On the contrary, adults themselves look back to childhood as a period of happy irresponsibility; and they look at their own children with a certain envy. Yet, they may take pride in a child's accomplishments, and try to modify the sting of failure, by saying, "He does the best he can." Or, "He's trying."

Sex differences in attitudes towards children become subtly apparent only in adolescence. For, then, girls are expected to stay closer to home, and parents attempt to guard the girl's virginity against secret courtship by boys and older men. Virginity, in itself, is not highly prized; rather, the emphasis is upon keeping a girl from indiscriminate sex-play, so that if, and when, she becomes pregnant the prospective father can be identified. So, for instance, a girl who has an accepted lover—one known to her parents—will not be punished for becoming pregnant. Though willingness to assume familial responsibility is an ideal character trait in a good man, it is generally felt that few men voluntarily accept paternity[14].

By the mere fact of having a child, a "girl" automatically becomes a "woman," but she can count on some help in assuming her new role from her mother. For a boy it is much less

[12] In a good marital relationship, a woman can maintain her sense of autonomy by working together with her husband or "keeper", as well as by working on her own.

[13] In this situation, the mother who can leave her infant with a grandparent, while she herself goes elsewhere to support the child, may be providing a better setting for the child.

[14] Reversing the situation, a thoroughly responsible father does not hesitate to criticize his wife for having too many children.

easy, in late adolescence, to become a "man," for he must demonstrate his autonomy in several spheres. And, indeed, even as adults begin to push an adolescent boy towards economic self-sufficiency, praising his efforts and criticizing the laggard as a loafer, they also condemn any of his actions by which he attempts to equalize his position vis-a-vis older people as showing "manliness," i.e., behavior unbecoming his youth, inexperience, and dependence. The adolescent boys — together with a few tomboy girls who flaunt their sexuality — are a group apart with no real ways of fitting themselves, as learners, into any other age group. This is most evident in courtship, which must be kept secret, so that no boy can turn for advice to, or learn from, the experience of his elders. As there is no one obvious way in which a boy can demonstrate his growing maturity, he must either grow in all things or else, as is more often the case, simply survive until he reaches the mid-twenties, when he is irrefutably "grown-up," irrespective of his abilities.

In Montserrat, as in other Caribbean peasant cultures, the peasantry itself is a socially and economically dependent group which can do little to further its welfare as a *group*, independently. In Montserrat, people feel strongly, also, that there is little the individual—man or woman—can do to improve or alter his or her own situation; instead, improvement is seen as following on removal from the Island, itself. In fact, it is probably easier for a man to leave the Island, and for a woman to gain a subsistence livelihood on the Island—and this is the usual division, if there is one.

In a brief discussion of this kind, it is impossible to do more than to indicate areas of investigation that are important in a particular culture; certainly, it is impossible to give an adequate picture of personality development. However, as this paper suggests, it is possible to indicate how and where two overlapping types of investigation — psychological and anthropological—can complement each other and both arrive at an understanding of certain crucial features in the delineation of personality—in this instance, of sex differences, in particular.

REFERENCES

1. Abel, Theodora M. Problems in cross-cultural evaluation of individuals and groups. Actas del Primer Congreso Interamericano de Psicologia. Ciudad Trujillo, 1956, 441-455 (Text in English and Spanish).

2. Abel, Theodora M. and Métraux, Rhoda. Pruebas proyectivas en una communidad rural: Montserrat. *Criminalia,* 1956, *2,* 100-108.

3. Abel, Theodora M., and Calabresi, Renata. The People as seen by their Rorschach Test. In *Life in a Mexican village.* Tepoztlán Revisited, Oscar Lewis (Ed.), Urbana: University of Illinois, 1951.

4. Baron, S. Suggestions for an improved M-Limits technique. *J. proj. Tech.,* 1951, *15,* 371-379.

5. Deri, Susan. *Introduction to the Szondi Test.* N.Y.: Grune and Stratton, 1949.

6. Gladwin, T. and Sarason, S. B. *Truk: Men in Paradise.* Viking Fund Publications, No. 20. N.Y.: Wenner-Gren Foundation for Anthropological Research, 1953.

7. Leeward Islands Colony. Report on the Education Department for the year 1951. Antigua: Government Printing Office, 1952.

8. Métraux, Rhoda. Montserrat, B.W.I.: Some implications of suspended culture change. *Trans. N. Y. Acad. Sci.,* 1957, *20,* 205-211.

9. Métraux, Rhoda and Abel, Theodora M. Normal and deviant behavior in a peasant community: Montserrat, B.W.I. *Amer. J. Orthophychiat.,* 1957, *27,* 167-184.

10. Oberholzer, E. Rorschach's experiment and the Alorese. In *The People of Alor,* Cora Dubois (Ed.). Minneapolis: University of Minnesota Press, 1944.

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An Experimental Analysis of the Relationship between Stimulus Structure and Behavior on the Rorschach[1,2]

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A person's responses to the Rorschach inkblots are dependent upon a considerable number of factors, most of which have been well analyzed by Sarason (14). Situational conditions, the set given to the subject (*S*), subjective definitions developed by the respondent, and personality factors in both *S* and the examiner (*E*) influence the verbal behavior of the *S*, as has been documented by numerous research studies.

Of first importance, however, in determining *S*'s response is the nature of the stimulus to which *S* is asked to respond. All *E*s, for example, recognized that card I tends to elicit a different class of response than does card X because of very different structural properties. Only in rare instances of extreme pathology does one find a type of perseveration that results in the same response being given to all 10 cards by an adult *S*. For most adult *S*s a change in response can be observed as the stimulus is changed.

Although it is evident that such individual card differences exist it is by no means clear as to how the various attributes of each card influence responses. The basic form of each blot is critical (see 2 and 3) in this regard, but the blots also differ in terms of color, shading, internal structure, and figure-ground contrast. The influence of such variables on response is not well understood, with the possible exception of color. A number of empirical studies have attempted to establish color effects, but adequate objective studies of shading and other blot properties are lacking. The author has reviewed the research literature on the role of the stimulus in Rorschach responses elsewhere (3) and the reader is referred to this article for background information.

The basic purpose of the work reported here is to present data which will make it possible to gain a clearer understanding of how responses to the Rorschach blots may or may not vary as a function of several blot properties. The focus is thus upon the relationship between response and stimulus structure.[3] An attempt will be made to present the data in such a way that the reader may use it to reach answers to his own questions which have not necessarily been of central concern to the writer. The presentation will also be in a form which should be useful to teachers of the Rorschach method, filling a vacuum that currently exists in the literature. Thus both research and teaching considerations have directed the organization of the presentation.

Procedure

Materials: The stimulus materials used in the research are presented in Figures 1-10, with the exception of the standard colored versions of cards II, III, VIII, IX, and X. Since the im-

[1] This investigation was supported by a research grant (M-1027) from the National Institute of Mental Health, National Institutes of Health, Public Health Service. Publication of the findings has been supported by a grant from the University Research Council, University of North Carolina.

[2] The author is grateful to H. M. Grainer, Patricia M. Waller, S. L. Guskin, R. L. Van de Castle, Frances C. Campbell, P. B. Fiddleman, Margaret Reid, G. W. Poole, Dorothy Greulach, Elizabeth Stewart, and J. J. Mellinger for assistance in the collection and analysis of data.

[3] The reader should clearly understand that when the term structure is used henceforth in this article that it refers to those stimulus attributes other than form, unless otherwise specified. If for example, the statement is made that "structure does not affect the frequency of the bat percept" this does not mean that form does not affect this response, only that those structural components of the stimulus other than form are not effective.

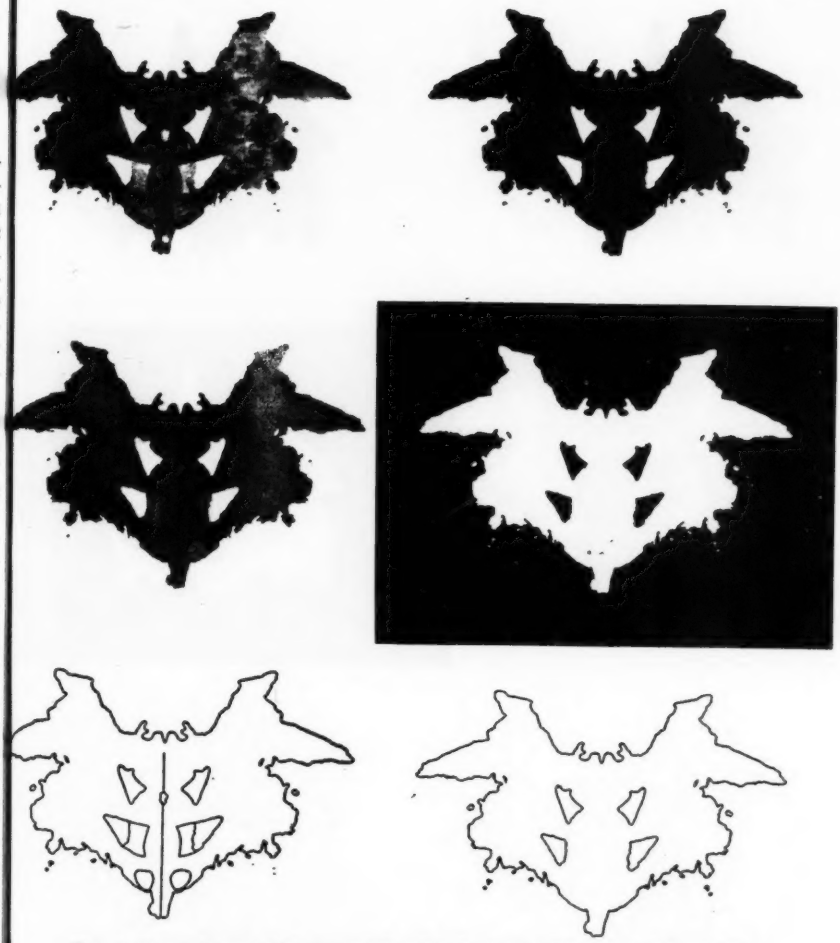

FIG. 1. Experimental Forms of Card I, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

portance of the basic form of the blots has been established, form has been held constant throughout the modification of the blots. Within this limitation of constant form one can say that the experimental stimuli represent systematic fractionations of the standard blots. The standard series of blots, possessing five colored cards, is referred to as the C or chromatic series. The remaining six series can be described as follows (and hereafter will be referred to by the letters in parentheses):

(A) *Achromatic:* Color is eliminated; remaining blot properties are retained as in series C.

(CS) *Complex Silhouette:*[4] Shading

[4] Due to difficulties in reproduction, the CS blots in Figures 1-10 differ in some respects from the blots actually used. All areas de-

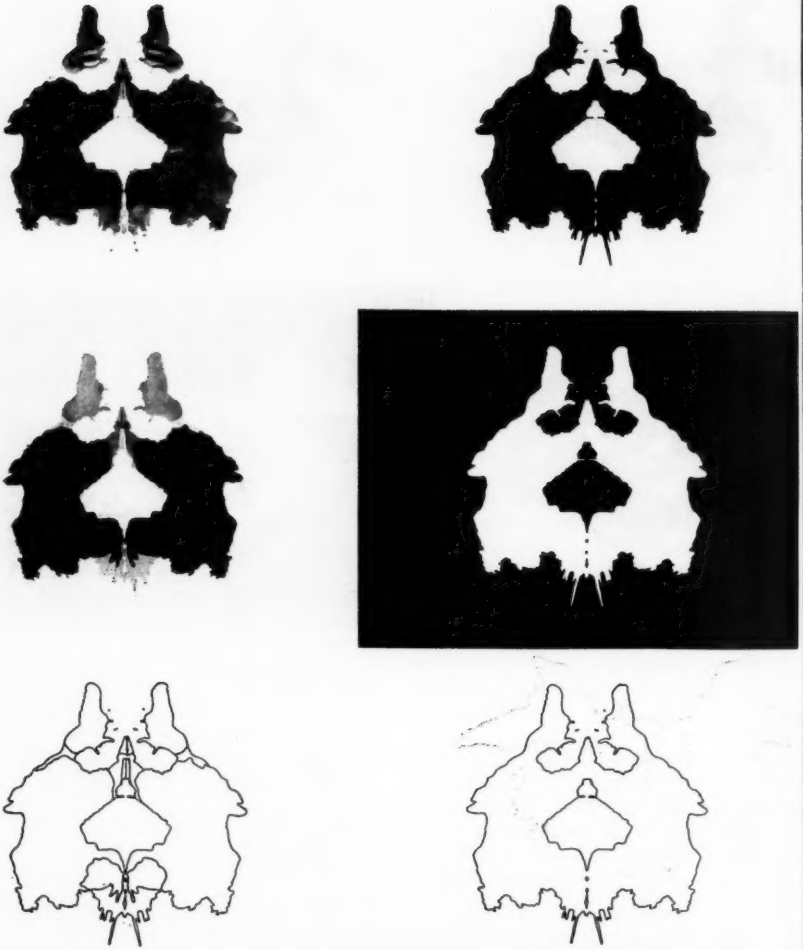

FIG. 2. Experimental Forms of Card II, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

variations are removed from series A; differentiations between major detail areas (as defined by Beck [6]) are retained by creating these areas so that they have different albedos. There is no variation in albedo within a given area, however.

(S) *Silhouette:* Uniformly grey figures; differences in albedos between adjacent areas, as found in series CS, are eliminated.

(W) *White:* White figures are placed on a uniformly grey background; a reversal of series S.

(CF) *Complex Form:* Figure-

fined on the CF series were also defined (by albedo differences) on CS although some of the reproductions fail to make this evident.

FIG 3. Experimental Forms of Card III, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

ground contrasts due to brightness differences are removed; forms of major detail areas are retained. The forms are like those of series CS.

(F) *Form:* Forms comparable to S and W are created, but figure-ground contrasts due to brightness differences are eliminated.

The basic form of the Rorschach blots is that found in series F; it is created by tracing with a stylus in such a way as to keep the stylus in constant contact with the white area of the card and a shaded or colored area. Each of the other series may be thought of as being created by the addition of "something" to these basic forms until the standard card is reached. The question then is how these successive stimulus alterations affect or fail to affect the responses of *Ss*. Later on it will be shown how distributions of re-

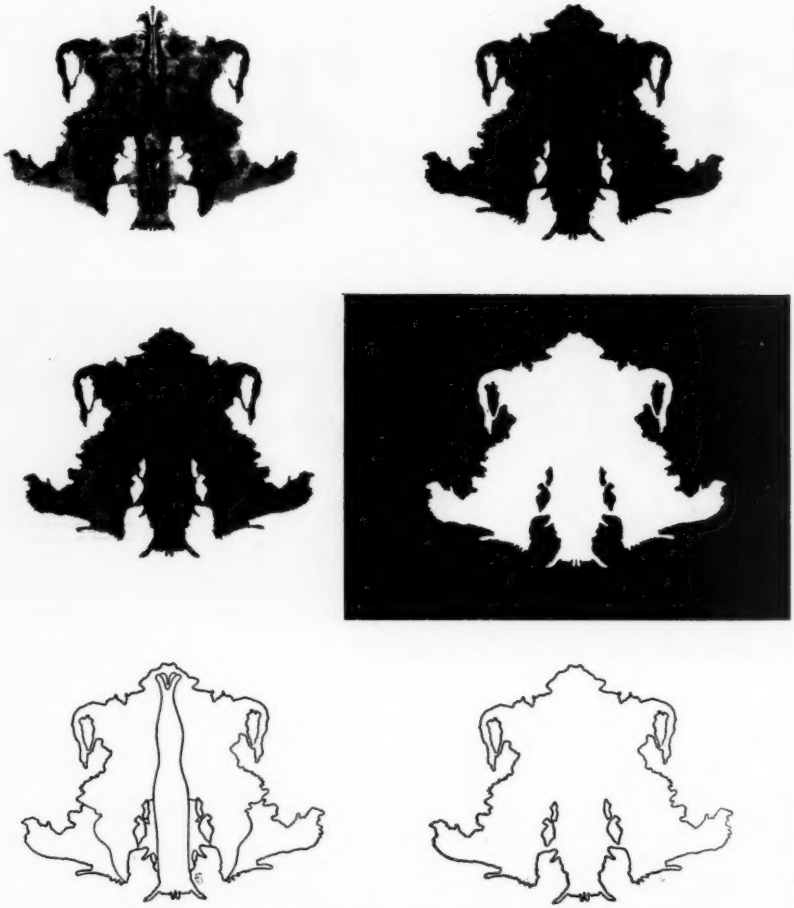

FIG. 4. Experimental Forms of Card IV, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

sponses to these series may be used to infer whether *S* has felt the impact of a particular stimulus attribute (such as color or shading) independently of any inquiry.

Series A was developed by Hans Huber publishers as described by Allen (1). The remaining series were developed by means of photographic processes (2). All modified figures were made identical in size with the standard blots and were mounted on cardboard of comparable weight.

These modified blots obviously are not the only ones that could be made and which would be of interest. Within the limitation of constant basic form, however, they make possible a reasonably thorough investigation of the relationship between blot structure and response.

Experimental Design: A total of 648

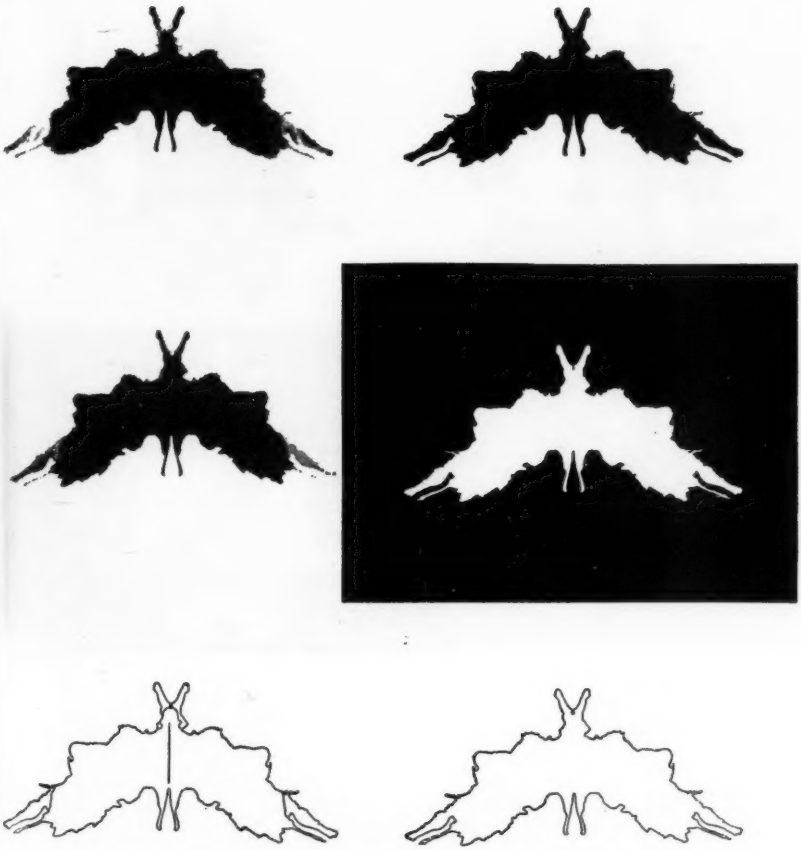

FIG. 5. Experimental Forms of Card V, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

adult *S*s participated in the experiment. These *S*s were randomly divided into eight different groups, each group being composed of 81 *S*s. *S*s in group A received the ten series A blots in the standard order, group CS the CS blots, group S the S blots, group W the W blots, group CF the CF blots, and group F the F blots. The remaining two groups received the standard Rorschach blots (i.e., series C), but the type of inquiry differed for the two groups. Group $C_{(S)}$ received the standard inquiry, as defined by Beck (6), while group $C_{(PC)}$ received a paired comparison inquiry, which has been described elsewhere (4). The paired comparison inquiry affects only color and shading scores, results which have been presented in another article (5).

After the eight groups had been formed they were compared with respect to intelligence, age, education, and sex; they did not differ significantly on these variables. Thus eight equated groups were formed, each *S* receiving a particular version of the

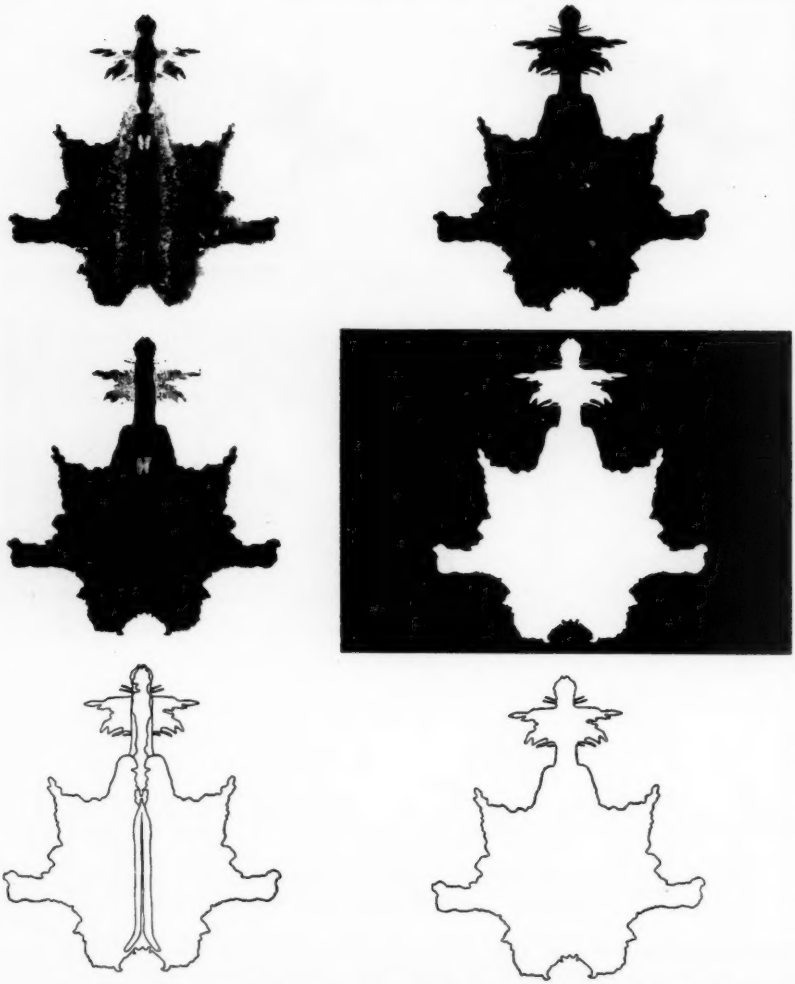

FIG. 6. Experimental Forms of Card VI, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

Rorschach dependent upon the group into which he had been placed.

Subjects: All home office employees of three insurance companies were permitted to leave their desks to participate as volunteer Ss in this research[5] Ss whose ages exceeded 50 years were excluded, however. Of the eligible employees, more than 85 per cent volunteered to participate in the research.

[5] Employee time and complete testing facilities were made available without charge by the Jefferson Standard Life Insurance Co., the Pilot Life Insurance Co., and the Southern Life Insurance Co. This most generous contribution is gratefully acknowledged, with special thanks to G. B. Phillips, Jr., J. W. Gawthrop, and T. C. Collins, Jr.

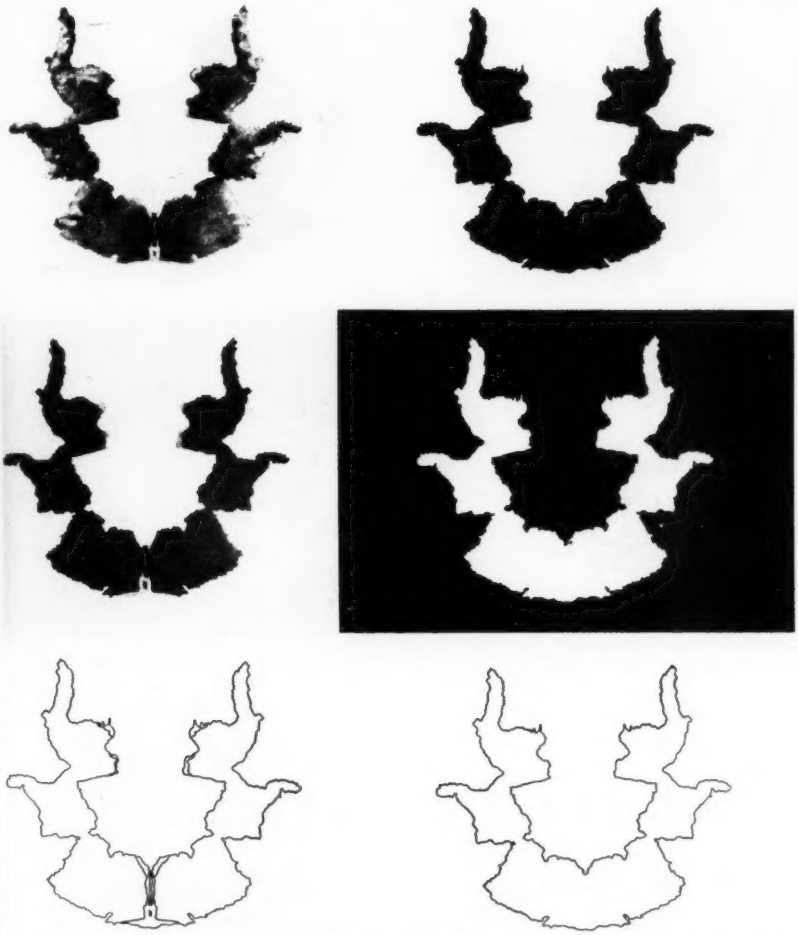

FIG. 7. Experimental Forms of Card VII, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

All occupational levels within the companies were well represented, from file clerk up through vice-president. Age, intelligence, sex and education characteristics of the groups and total sample are presented in Table I. The left side of this table includes data for all *Ss*; the right side is for a subsample in which groups were also equated for the number of responses that they gave to the blots, a procedure to be described later.

Approximately three-fourths of the *Ss* were females. Ages ranged from 17-50, with a mean in the late twenties. All *Ss* had completed high school, and about one-sixth had completed college.

Intellectual level of *Ss* was determined by individually administering the Thurstone Test of Mental Alert-

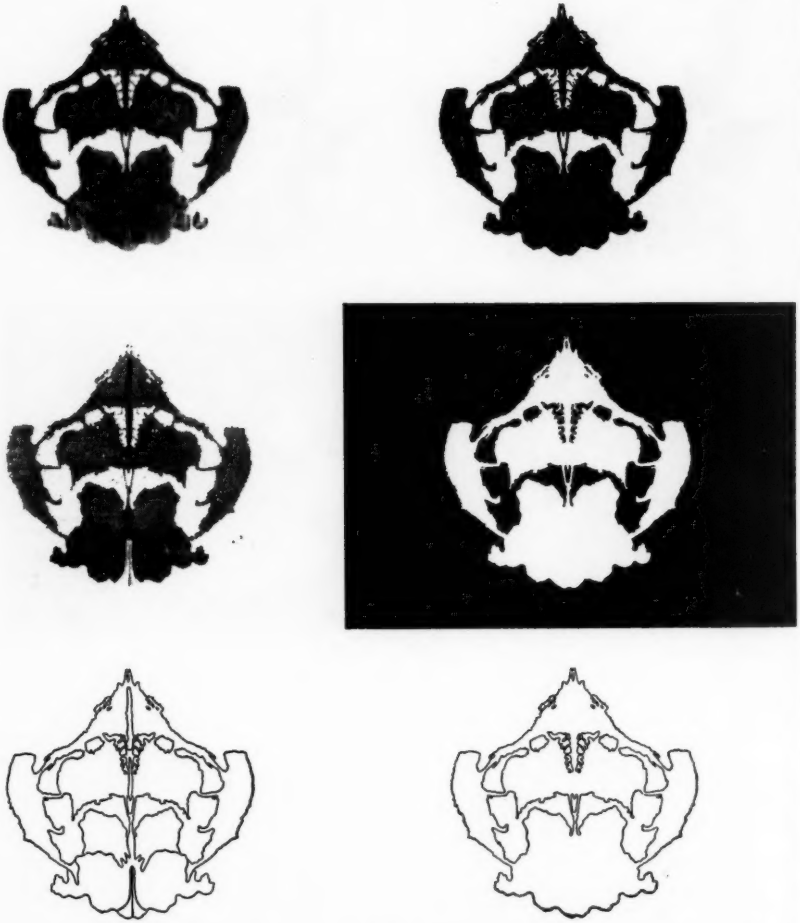

FIG. 8. Experimental Forms of Card VIII, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

ness, Form A. Raw scores on this test ranged from 14-120 with a mean score of 54.4 for the 648 *Ss*. Otis IQ (Higher Examination: Form A) scores were also available for 129 *Ss*. A regression equation indicates that a Thurstone score of 54.4 is equal to an Otis IQ of 104.3 for this group.

Significant between group variation (for both the total and matched groups) with respect to age and intelligence was ruled out by analyses of variances; chi-square analyses indicated a similar lack of significant between group variation in sex and education.

Examiners: All testing was done by two *Es*, one male, one female. The female *E* tested 19 *Ss* in each of the 8 groups while the male *E* tested 62 *Ss* in each group. *Ss* were assigned to the *Es* on a random basis during those

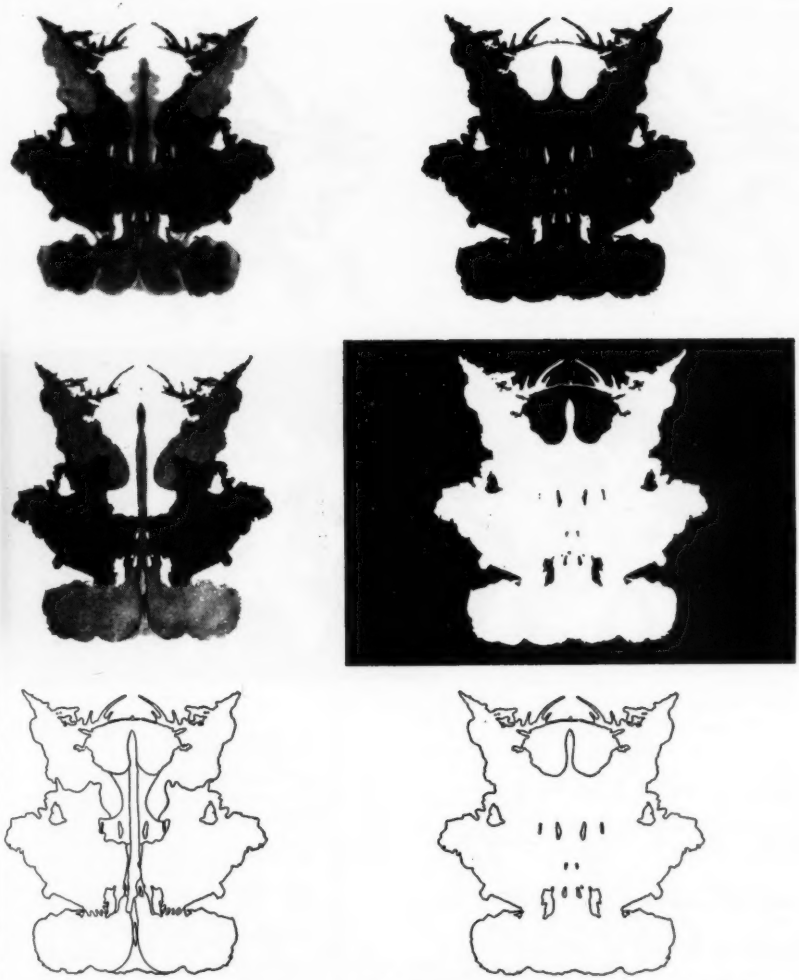

FIG. 9. Experimental Forms of Card IX, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

periods when both *E*s were testing *S*s.

Testing Procedure: E began the testing session by having *S* provide personal history data which were recorded on a standard form. *E* then administered one of the series of Rorschach blots ($C_{(S)}$, $C_{(PC)}$, A, CS, S, W, CF or F), the particular series having been determined in advance of contact with *S* through use of a table of random numbers. The same instructions were used for all *S*s and followed Beck (6), except for the fact that each *S* was told that he would see a series of ten designs, thus avoiding the word "inkblots." Encouragement was given *S* on the first two cards if he did not report at least two responses on each of these

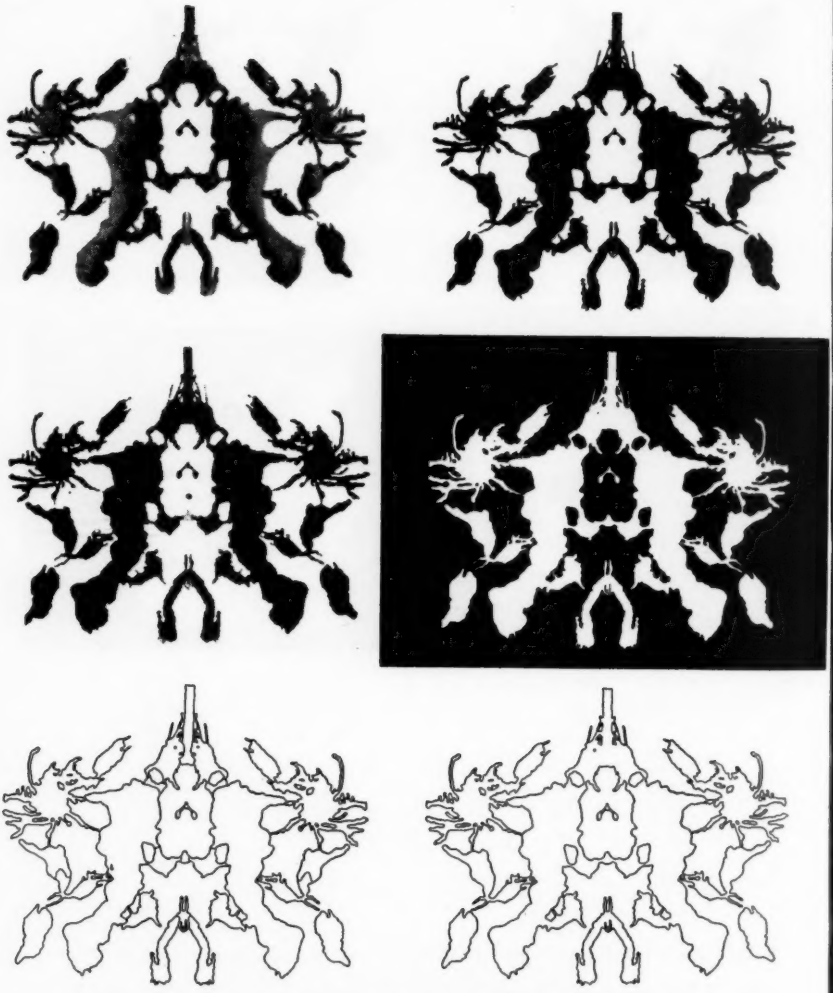

Fig. 10. Experimental Forms of Card X, Series A, CS, CF, S, W, and F Reading Top to Bottom, Left to Right.

cards; after card II no further encouragement was offered. An inquiry for location and content followed the free association; in addition a determinant inquiry was used for groups $C_{(S)}$ and $C_{(PC)}$. Upon conclusion of the inquiry each *S* was administered form A of the Thurstone Test of Mental Alertness. This concluded the testing session.

Scoring: Two scorers (not the *Es*) were used to compute psychograms; each scored an equal number of records in each of the eight groups. Scoring was done independently except for consultation on the handling of difficult scoring problems. The summary

TABLE I—Subject Characteristics of Total Groups and Matched Groups (for Productivity) Receiving Each Stimulus Series

		Total Groups											Matched Groups										
		C (PC)	C (S)	A	CS	S	W	CF	F	Total	F	Chi-square	p	C (PC)	C (S)	A	CS	S	W	CF	F	Total	F	Chi-square	p
Age	Mean (in years)	26.6	26.8	27.9	27.6	27.2	27.5	27.6	27.0	27.3	<1.00		> .50	25.8	26.5	27.1	26.7	27.2	27.1	27.9	27.3	27.0	<1.00		> .50
	SD	7.5	7.6	8.5	8.3	8.4	8.8	7.7	7.6	8.0				6.9	8.2	8.0	7.4	8.2	8.7	7.8	6.9	7.7			
Intelligence*	Mean	54.6	54.9	57.0	51.5	55.3	50.8	54.8	56.5	54.4	1.05		> .50	50.7	51.3	55.0	48.7	54.0	48.4	51.3	53.2	51.6	<1.00		> .50
	SD	19.2	16.4	19.8	19.7	19.3	18.5	21.1	20.4	19.3				19.0	16.5	18.4	20.3	19.6	16.0	21.3	16.6	18.5			
Sex	Male	11	18	24	18	15	17	25	25	151		13.19	.10	4	7	7	6	6	8	10	11	59		5.87	.70
	Female	70	63	57	65	66	64	56	56	497		(df=7)		39	36	36	37	37	35	33	32	285		(df=7)	
Education	High School	45	46	42	43	44	44	41	35	340		20.20	.70	25	25	26	25	26	25	23	17	192		14.00	.90
	Business College	17	9	11	14	15	12	12	12	102		(df=21)		9	7	6	8	9	6	8	9	62		(df=21)	
	Part College	10	14	9	14	7	12	12	17	98				5	7	3	6	4	7	8	11	51			
	Completed College	9	12	19	10	15	9	16	17	107				4	4	8	4	4	5	4	6	39			
TOTAL	N	81	81	81	81	81	81	81	81	648				43	43	43	43	43	43	43	43	344			

*Table entries based upon raw scores on Thurstone Test of Mental Alertness, Form A.

psychogram for each *S* included the following scores:

R — total number of scorable responses.

W — number of whole responses.
D — number of major detail responses.
Dd — number of minor detail responses.
} following Beck (6)

S — number of responses involving an area which would be scored as white space on series C; includes complete figure-ground reversals and responses in which a background area is used along with part or all of the regular figure area.

M — number of human movement responses scorable on the basis of the free association.

FM — number of animal movement responses scorable on the basis of the free association.

m — number of inanimate movement responses scorable on the basis of the free association.

F+% — number of accurate forms divided by the sum of the number of accurate and inaccurate forms, i.e., $\frac{F+}{F+ \ +F-}$; tables of Small (15) and Beck (6) used as basic references.

$\frac{8\text{-}10\%}{R}$ — number of responses on cards VIII, IX, and X divided by total R.

A% — number of animal responses divided by total R.

P — number of popular responses, following Beck (6).

T/1R — average time per first response, in seconds.

T/R — average time per response, in seconds.

Total Time — time spent responding to each card, in seconds.

In addition color and shading scores were computed for groups $C_{(S)}$ and $C_{(PC)}$; these have been reported in a separate article (5). Interscorer re-

liability was computed for color and shading scores; the product-moment correlation coefficients exceeded .90 for both C groups. Reliability coefficients were not computed for the other scores since, as Holtzmann (11) points out, the reliability of scoring determinants is consistently lower than that for other categories. With a high reliability for scoring color and shading it is unlikely that scoring reliabilities for the other categories would be significantly lower.

Formation of Matched Groups: Analysis of productivity indicated that R varied as a function of stimulus attributes (see Table 2); therefore it was decided to form subsamples from each group selected so as to control for this factor. This was done by means of the following steps:

1. The number of records from each group falling within intervals of five responses was tabulated.

2. The number of records to be included from each group in the matched sample was determined by taking the lowest frequency within each of these response intervals.

3. For groups having more than the minimum frequency in a response interval, records were selected at random equal to the minimum frequency.

The above procedure resulted in a subsample of 344 *Ss*, with groups matched for productivity, each group composed of 43 *Ss*, and distributed as follows:

Number of Responses (R)	*Frequency*
5 - 9	6
10 - 14	15
15 - 19	10
20 - 24	3
25 - 29	6
30 - 34	2
35 - 39	1

As with the total sample, the groups in the subsample did not differ significantly from one another with respect to the variables of age, intelligence, sex, or education (see Table I). Groups in the matched sample, however, had productivity levels significantly below those in the total group (see Table II).

Analysis of Results: Three major analyses of the data were undertaken. The first was concerned with the variation in total summary scores as a function of stimulus characteristics. The second was directed toward each of the ten cards in order to better understand variation in formal scores on that card as a function of its properties. A third analysis also focused upon the individual cards, but it was addressed to the problem of content and how the content of responses to a figure may or may not change as a result of particular blot properties. For convenience, these analyses are referred to as the total summary analysis, the card analysis, and the content analysis respectively.

The total summary analysis and the card analysis were carried out in an identical manner for the total sample of 648 *Ss* and for the subsample of 344 Ss matched for R. In Tables I-XII these are referred to as the "Total Groups" and "Matched Groups" respectively. Table XIII, presenting content tabulations, is based upon the total group.

Chi-square was chosen as the preferred method of statistical analysis for a number of reasons related to the nature of the distributions of Rorschach scores, as has been discussed in detail by Cronbach (9). These analyses were carried out by pooling all scores, selecting that score at or most near to the median, and then determining the number of Ss in each group who fell above and below this cutting point. Since groups $C_{(S)}$ and $C_{(PC)}$ responded to identical stimuli, scores of Ss in these two groups were combined for the analyses. The chi-square analyses thus involved six degrees of freedom.

Results I: Total Summary Analysis

A score was computed for each *S* over all ten cards for each scoring category as listed in Table II. This table presents the means, medians, and

Table II—Summary Scores for Total Groups and Matched Groups (for Productivity) Receiving Each Stimulus Series

TABLE II—Summary Scores for Total Groups and Matched Groups (for Productivity) Receiving Each Stimulus Series

Scoring Category		Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Chi-square	p
R	Mn	21.1	23.1	19.8	24.7	17.8	19.4	26.0	22.0			16.7	16.7	16.4	17.3	16.9	17.1	16.6	16.4		
	Mdn	15.6	18.0	15.9	19.7	14.3	17.2	19.7	17.0	20.17	.01	14.8	14.7	14.8	16.0	14.3	14.8	14.7	14.0	0.36	.99
	SD	15.7	15.9	12.9	17.2	9.7	9.7	34.9	19.1			7.3	7.5	6.5	7.5	8.2	8.0	7.8	7.6		
W	Mn	6.0	6.8	6.4	5.6	6.4	7.0	7.4	8.6			5.2	6.2	5.7	4.8	6.6	6.8	6.4	9.1		
	Mdn	5.1	5.8	6.1	4.2	5.8	6.4	5.8	7.8	9.22	.20	4.6	5.9	5.6	3.6	5.6	6.1	5.6	8.1	3.75	.80
	SD	4.1	6.9	3.7	4.6	3.6	4.3	6.1	6.4			3.5	3.1	3.5	3.6	4.1	3.9	3.8	6.2		
D	Mn	13.7	14.5	11.3	15.6	9.7	10.2	14.5	9.7			10.8	10.1	9.4	10.8	9.0	8.7	9.0	6.1		
	Mdn	9.9	12.8	8.9	12.9	7.6	8.7	10.9	7.1	33.48	.001	9.4	9.0	8.1	10.8	7.2	7.9	7.1	6.0	14.66	.05
	SD	12.2	10.6	9.1	10.9	7.2	6.8	17.4	9.7			6.2	6.5	6.4	5.9	6.2	5.6	6.3	4.0		
Dd	Mn	1.4	1.7	2.1	4.1	1.7	2.2	3.9	3.7			0.6	0.5	1.3	1.6	1.3	1.7	1.2	1.2		
	Mdn	0.3	0.4	0.5	1.0	0.3	0.8	1.2	1.1	22.62	.001	0.2	0.2	0.4	0.4	0.3	0.4	0.6	0.5	8.41	.30
	SD	4.0	4.2	5.8	9.5	3.6	4.3	14.1	7.8			1.3	1.2	2.3	3.1	2.5	3.1	1.8	2.1		
S	Mn	0.3	0.3	0.2	0.5	0.4	1.4	1.9	1.8			0.2	0.1	0.1	0.4	0.3	1.3	0.6	0.7		
	Mdn	0.1	0.1	0.1	0.2	0.1	0.4	0.5	0.7	84.94	.001	0.1	0.1	0.0	0.1	0.1	0.3	0.2	0.3	32.60	.001
	SD	0.9	0.9	1.0	1.2	1.0	2.6	5.8	3.3			0.5	0.4	0.3	1.4	0.8	2.9	1.1	1.3		
M	Mn	1.6	1.5	1.6	2.7	2.6	2.1	2.5	1.9			1.1	0.9	1.5	1.6	2.7	2.1	1.6	1.5		
	Mdn	1.1	1.0	1.6	1.5	2.4	1.5	1.6	1.2	24.58	.001	0.8	0.4	1.5	1.1	2.3	1.6	1.5	1.2	27.51	.001
	SD	1.9	1.8	1.5	3.4	1.9	2.2	3.2	2.4			1.4	1.3	1.4	1.6	2.2	2.1	1.3	1.4		
FM	Mn	2.1	1.6	1.2	1.5	0.7	0.9	1.4	0.9			1.7	1.0	0.8	1.0	0.7	0.8	0.7	0.5		
	Mdn	1.4	1.1	0.9	1.0	0.5	0.6	0.6	0.3	29.08	.001	1.2	0.8	0.7	0.8	0.5	0.5	0.4	0.2	15.14	.02
	SD	2.2	2.0	1.5	1.7	0.9	1.2	2.6	1.5			1.9	1.2	0.9	1.1	0.9	1.0	1.0	0.9		
A%	Mn	52.0	52.3	53.2	43.1	45.1	42.1	39.8	40.2			51.4	51.5	55.1	46.5	44.8	40.5	38.6	40.7		
	Mdn	49.2	49.6	50.0	41.8	44.1	41.8	39.9	40.2	54.34	.001	49.0	48.9	53.0	43.9	44.4	40.8	38.4	38.4	43.25	.001
	SD	13.9	16.8	15.1	13.7	12.6	15.5	13.8	16.9			12.8	17.3	12.9	15.2	12.6	14.6	14.0	19.0		
F+%	Mn	86.0	87.7	85.6	87.9	86.8	86.0	82.9	83.6			86.0	88.6	87.7	89.5	85.3	85.0	84.3	85.7		
	Mdn	87.2	87.8	87.2	88.3	88.6	88.9	84.0	85.3	10.89	.10	88.0	88.6	88.2	89.9	88.0	87.6	81.3	87.4	3.01	.90
	SD	9.2	7.8	9.2	8.3	9.8	11.1	11.6	10.7			9.9	7.8	7.5	8.2	11.3	12.3	11.5	10.3		
$\frac{S-10}{R\%}$	Mn	37.8	36.8	32.9	34.5	33.8	36.1	33.8	34.9			35.9	35.4	31.6	33.4	32.7	36.3	31.9	33.0		
	Mdn	37.8	36.6	33.1	33.9	35.9	36.3	34.8	34.6	11.73	.10	36.8	35.2	30.8	32.0	35.0	36.6	32.8	32.3	8.59	.20
	SD	9.0	9.6	9.3	12.6	11.4	8.2	10.7	11.1			8.9	10.1	9.4	12.8	13.0	8.7	10.1	9.5		
P	Mn	5.4	5.5	5.4	5.7	5.3	5.1	3.9	3.9			5.0	4.6	5.4	5.3	4.7	4.7	3.4	3.8		
	Mdn	4.8	5.2	5.6	5.8	5.2	5.3	3.7	4.0	32.34	.001	4.7	4.2	5.6	5.4	4.6	4.8	3.3	3.8	21.50	.01
	SD	2.4	2.6	2.3	2.5	2.2	2.0	2.1	1.2			2.0	2.3	2.1	2.5	2.1	2.1	1.8	1.8		
T/1R (Secs)	Mn	24.1	27.5	26.8	25.0	22.7	30.1	24.1	23.7			24.9	30.4	22.5	30.2	21.8	36.5	26.6	24.7		
	Mdn	19.8	22.1	21.1	17.3	15.8	22.3	20.3	16.8	9.20	.20	19.9	25.8	20.2	20.2	15.3	24.9	25.0	15.2	9.11	.20
	SD	14.9	21.2	19.2	30.4	18.6	28.3	16.0	21.2			14.8	22.2	14.2	36.5	16.5	36.4	16.6	25.6		
T/R (Secs)	Mn	42.5	44.4	50.2	49.1	44.0	53.0	43.2	46.1			44.6	51.1	46.2	55.0	45.7	65.5	47.6	46.7		
	Mdn	39.4	40.8	45.1	38.0	38.4	39.0	40.9	35.5	5.64	.50	40.0	47.4	41.2	44.7	39.3	51.2	45.5	36.3	3.83	.70
	SD	65.0	22.8	25.4	40.8	28.1	45.6	22.0	37.2			19.7	26.3	22.2	35.4	30.8	57.7	24.0	40.3		
TOTAL	N	81	81	81	81	81	81	81	81			43	43	43	43	43	43	43	43		

standard deviations for each of these scoring categories, according to the series of blots received by the *Ss*. The significance of between group variation is also presented in Table II, for both total and matched groups. Examination of Table II permits one to assess the extent to which the formal properties of the overall behavior are affected by blot attributes. Statistical comparison of each group with every other group for the 13 scoring categories, and discussion of these results, would necessitate the use of more space than is available here. The general and most significant trends can be seen from inspection of Table II, however.

Previous work (2,3) has suggested marked stability in summary scores when blot properties (especially color) are altered. The present research, while retaining basic form throughout, has increased the number of structural modifications as well as the number of *Ss* in each of the experimental groups. Under these conditions one might anticipate that it would be possible to demonstrate significant variation in the formal aspects of perception related to stimulus composition, and the data in Table II support this expectation. Nevertheless the absolute variation in most scores from group to group is not very large. Some of the findings regarding each score will now be summarized.

R: The mean number of responses given by the *Ss* to the C series was about one-third less than that reported by Beck et al (7) in their normative study. In a subsequent study of 60 neurotic patients, from the same geographical area as *Ss* in the current study, and with comparable educational backgrounds, Waller (16) also reports a mean R in the low twenties ($\overline{X}_{\pi} = 20.1$). Several factors may account for the differences between these two studies and that of Beck et al, but there is no way to specify them with certainty.

Within the experimental series R increased when discrete D areas were accentuated in the stimuli (series CF and CS), as indicated by both mean and median scores. Mean scores also suggest that R was depressed when the stimuli were made more uniform (series S, W, and A), but median scores failed to substantiate this. Variability in productivity was dampened on series S and W, and was markedly increased on CF. Chi-square was significant at the .01 level, justifying the conclusion that stimulus structure, apart from basic form, does affect productivity. The accentuation of definite major blot areas appears to be primary in affecting productivity level; increase the number of areas with well defined contours and productivity increases.

W: The mean number of whole responses for series C was slightly greater than that reported by Beck et al (7), despite the significantly lower R. The study by Fiske and Baughman (10), makes this finding understandable, however, since it shows a negligible relationship between W and R.

Both the total groups and matched groups analyses failed to reveal a significant relationship between blot structure and the W response. Variations in blot composition, aside from basic form, did not affect the overall frequency of this response. Section II of the results, however, will demonstrate that structure did affect W frequency on individual cards; also that the results in the total analysis are due to compensating differences over the ten cards.

D: The frequency of major detail responses was dependent upon blot structure, although the level of confidence in this statement is reduced as the result of the matched groups analysis. It may well be, however, that R is affected by the pull of D area responses and that the basic "pressure" within *S* is to interpret well-defined contours rather than to give as many responses as is possible.

D responses tended to be least numerous on those series which have relatively homogeneous stimuli, i.e.,

series S, W, F and A. Clear delineation of D areas increased responses to these areas without leading to a significant overall reduction in W responses, as noted above. It has often been observed that *Ss* typically begin with a whole response and then proceed to give detail responses. Altering internal structure does not destroy the W orientation, but it does affect subsequent D behavior.

It is also to be noted that variability in D was especially pronounced on the CF series.

Dd: Significant variation in the frequency of minor detail responses was found for the total group analysis but not for the matched group analysis. The pattern of scores in this category is difficult to interpret even for the total groups. Series CS, CF, F and W elicited more Dd responses than did the other four series, but the reasons for this are not evident.

S[6]*:* The matched groups analysis as well as the total groups analysis confirmed the expectation that space responses would be significantly affected by stimulus structure ($p = .001$). The relatively high frequencies of S responses on series CF and F were also anticipated, since these figures create much more ambiguity with respect to what is figure and what is ground.

A more interesting finding is the high frequency of space responses on series W. Many *Ss* found white figures difficult to interpret, as evidenced by their verbalizations and also by the fact that the mean response time was longer for each card in the W series than for the comparable card in series S. Objects are usually seen as standing out against lighter backgrounds, and to reverse this relationship creates difficulties for many *Ss*. In this situation a significant number of *Ss* reversed the intended figure-ground relationship and gave an S response.

M: Human movement responses were also significantly affected by blot structure, as shown by a $p = .001$ in both analyses. Research with neurotics (2) had demonstrated that the S series has an unusually high pulling power for M responses and the current data confirm this earlier finding. It is also of interest that the C series had the lowest pulling power for M.

Work of Belden and Baughman (8) suggests that the frequency of M responses is not a function of degree of contrast per se. Rather the important factor seems to be the extent to which the structure of the stimulus calls attention to an area which has a distinctly human-like form. Table XIII, for example, shows that on card II, series S two persons (usually in movement) were seen by 66 of the 81 *Ss*. In the two C groups, by comparison, only 11 *Ss* out of 162 reported seeing the whole card as two persons. By doing away with the red-black discontinuity it was much easier for most *Ss* to perceive the human forms, and these forms were usually reported as being in motion. The basic suggestion being made here is that the blot structure affects the content of the perception rather than imparting directly a feeling of movement or activity. (Detailed discussion of content variation may be found in Results III).

FM and *A%:* Stimulus structure had significant effects upon both the per cent of animal responses and the frequency of animal movement responses. Blots with shading (i.e., series C and A) clearly provoked a greater number of animal associations than did white or uniformly grey blots. The suggestion of furriness created by shading differentials is probably the causal factor. FM scores, as one would anticipate, were likewise relatively high for groups C and A, but group CS was also elevated on FM.

F+%: The groups showed marked uniformity in form accuracy; one cannot reject the null hypothesis. This finding was contrary to expectations since it was believed that some series

[6] Any response which would be scored S on series C has been scored S for the purpose of this analysis. This means of course that responses to grey areas on series W have been scored S.

might be experienced as more difficult than others and that in order to get "reasonable" productivity some *Ss* might sacrifice their standards as far as accuracy was concerned. The data, however, do not bear out this prediction. There is evidence that the series were experienced as being of differential difficulty, but *Ss* did not respond to this by giving a greater per cent of inaccurate percepts.

8-10/R%: Several studies (3) have shown that this index is not significantly affected by the fact that the last three cards in the test are in color. The many other alterations made in this research also failed to have significant effects upon the index. The dependence upon basic form is thus underscored even further.

P: The frequency of Beck's popular responses was affected by stimulus structure. Some of these percepts were more easily seen in the non-colored cards (series A and CS), but there was a definite decrement in the outline series (CF and F). Content tables in Results III assist in clarifying effects upon particular popular responses.

T/1R and T/R: The data do not permit rejection of the null hypothesis, thus again pointing to minimal structural effects. Tempo is more a function of the interaction of personal characteristics with basic form than it is of structural properties as here defined. A more detailed analysis of time effects was carried out, however, on a card by card basis and this analysis necessitates consideration of a modification of this statement. *Ss* consistently took longer to form their initial responses to series W blots, for example, than to series S blots; the length of time taken to form each response was also longer on series W. By pulling out two groups for comparison we may be taking advantage of chance factors, yet the consistency of this pattern when figure is changed from grey to white is worth noting.

Summary: Analyses of total scores indicated a number of ways in which behavior in response to the Rorschach blots is affected by blot structure. To examine this dependence more closely it is necessary to go to individual card analyses.

Results II: Card Analysis

The following questions were asked regarding *S*'s performance on each of the ten cards given to him:

1. How many responses did he give? (R)
2. Where were his responses located? (W, D, Dd)
3. Was there complete or partial reversal of figure-ground? (S)
4. Did he project movement into the blot? (M+FM+m)
5. How quickly did he give his first response? (T/1R)
6. What was the mean time taken to give each response? (T/R)
7. How long did he work on the card? (Total Time)

Scores for each *S* on each card were computed for the above scoring categories, and the frequencies of various scores according to stimulus series have been tabulated in Tables III-XII. There are ten tables in this analysis, one for each of the ten cards. Figure 1 presents card I and its variations. Table III summarizes the data obtained in response to these stimuli. Figures 2-10 are related in a similar fashion to Tables IV-XII. Separate tabulations are presented for the total and matched groups, as are chi-square tests of significance based upon six degrees of freedom.

Examination of these tables makes it possible to suggest answers to many problems that arise concerning the bases of behavior in response to the blots. The tables are presented in detail because it is intended that they be used as a basic point of reference in understanding each card and the behavior which it elicits. Discussion in detail of these questions is not possible, but it should be evident that comparisons between tables as well as within tables will be useful. Thus one can look at the data for a particular card

TABLE III—Frequencies of Scores on Card I According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	1	0	3	2	2	4	3	1	16			0	0	3	2	1	3	2	1	12		
	1	36	30	26	27	29	37	24	34	243	7.07	.50	19	18	16	17	16	26	16	20	148	9.49	.20
	2	24	27	30	26	27	22	33	22	211			15	16	17	15	13	5	19	12	112		
	3 or >	20	24	22	26	23	18	21	24	178			9	9	7	9	13	9	6	10	72		
W	0	14	11	25	19	24	25	9	15	142			7	7	15	12	14	17	5	9	86		
	1	48	47	27	38	37	40	39	35	311	14.78	.05	25	26	17	24	19	20	23	16	170	13.13	.05
	2	12	11	21	21	15	9	25	21	135			8	7	9	7	7	2	12	11	63		
	3 or >	7	12	8	3	5	7	8	10	60			3	3	2	0	3	4	3	7	25		
D	0	45	40	45	39	40	44	57	53	363			24	23	26	22	19	24	35	32	205		
	1	21	27	20	25	19	25	17	24	178	14.09	.05	13	13	10	14	11	15	7	11	94	19.06	.01
	2	8	9	10	11	13	12	4	3	70			2	5	4	4	8	4	1	0	28		
	3 or >	7	5	6	6	9	0	3	1	37			4	2	3	3	5	0	0	0	17		
Dd	0	74	75	68	64	75	69	61	69	555			42	42	39	36	41	38	32	38	308		
	1	5	6	10	12	2	10	15	6	66	18.64	.01	1	1	3	5	1	5	11	3	30	19.85	.01
	2 or >	2	0	3	5	4	2	5	6	27			0	0	1	2	1	0	0	2	6		
S	0	71	64	72	65	78	67	55	50	522			37	37	38	38	42	35	28	27	282		
	1	8	15	7	13	3	13	19	27	105	44.06	.001	5	6	4	5	1	8	13	13	55	29.31	.001
	2 or >	2	2	2	3	0	1	7	4	21			1	0	1	0	0	0	2	3	7		
M+FM+m	0	65	64	77	70	70	68	81	79	574			31	35	42	37	40	38	43	42	308		
	1	15	13	4	10	11	12	0	2	67	35.52	.001	11	6	1	6	3	5	0	1	33	13.65	.05
	2 or >	1	4	0	1	0	1	0	0	7			1	2	0	0	0	0	0	0	3		
T/1R (Secs)	Mn	19.0	16.5	18.3	16.4	15.7	20.3	16.7	15.6														
	Mdn	12.3	12.2	13.6	9.9	11.6	12.8	11.6	10.1		8.70	.20											
	SD	17.6	17.1	17.1	20.1	12.8	18.9	16.8	16.7														
T/R (Secs)	Mn	37.0	36.6	35.0	39.2	31.8	45.2	40.4	36.1														
	Mdn	31.6	29.3	31.1	30.8	28.7	36.6	33.8	28.8		3.05	.90											
	SD	26.4	25.1	20.9	32.5	18.6	30.0	25.9	24.8														
Total Time (Secs)	Mn	66.8	69.8	71.7	76.9	60.9	70.3	78.2	62.6														
	Mdn	55.3	56.8	65.5	63.0	48.0	61.1	61.3	58.9		9.40	.20											
	SD	42.7	48.7	46.2	57.3	43.5	35.6	51.0	34.0														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

TABLE IV—Frequencies of Scores on Card II According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	6	8	2	5	3	2	8	6	40			4	7	0	3	2	1	5	2	24		
	1	32	30	43	31	53	42	23	27	281	22.27	.01	18	19	25	23	28	24	16	19	172	5.51	.50
	2	26	23	20	16	15	18	22	25	165			11	12	9	8	8	7	14	13	82		
	3 or >	17	20	16	29	10	19	28	23	162			10	5	9	9	5	11	8	9	66		
W	0	56	53	18	42	9	13	36	18	245			35	27	7	23	6	7	20	7	132		
	1	20	23	54	31	60	52	27	42	309	125.75	.001	7	13	30	18	30	29	16	21	164	84.17	.001
	2	4	4	8	6	12	13	9	14	70			1	3	5	1	7	6	5	10	38		
	3 or >	1	1	1	2	0	3	9	7	24			0	0	1	1	0	1	2	5	10		
D	0	20	21	47	28	67	57	34	49	323			9	17	30	18	37	30	23	33	197		
	1	34	28	23	25	11	18	24	19	182	103.07	.001	20	15	6	16	5	8	10	7	87	56.85	.001
	2	15	19	8	11	3	4	8	9	77			7	10	6	4	1	3	6	3	40		
	3 or >	12	13	3	17	0	2	15	4	66			7	1	1	5	0	2	4	0	20		
Dd	0	72	78	71	69	73	65	72	62	562			38	41	38	39	39	34	41	36	306		
	1	7	1	7	5	4	10	8	13	55	16.46	.02	4	1	4	2	2	7	2	5	27	8.28	.30
	2 or >	2	2	3	7	4	6	1	6	31			1	1	1	2	2	2	0	2	11		
S	0	71	66	75	65	69	51	56	40	493			37	39	40	36	37	29	31	27	276		
	1	9	13	6	14	10	19	22	30	123	64.52	.001	6	3	3	6	5	7	11	12	53	23.76	.001
	2 or >	1	2	0	2	2	11	3	11	32			0	1	0	1	1	7	1	4	15		
M+FM+m	0	40	49	35	54	25	33	53	44	333			27	32	16	35	14	18	33	23	198		
	1	37	28	41	26	56	47	22	35	292	34.57	.001	15	11	24	8	29	24	8	20	139	43.69	.001
	2 or >	4	4	5	1	0	1	6	2	23			1	0	3	0	0	1	2	0	7		
T/1R (Secs)	Mn	22.3	26.0	22.9	23.5	18.1	24.7	23.0	20.9														
	Mdn	18.4	15.3	15.3	13.8	9.5	16.2	16.6	14.1		4.57	.70											
	SD	18.1	38.0	22.2	32.5	20.8	26.7	19.7	18.6														
T/R (Secs)	Mn	47.2	53.6	53.2	51.6	50.4	53.6	44.4	42.6														
	Mdn	38.8	43.7	45.8	36.9	42.7	48.4	40.1	33.7		10.51	.20											
	SD	28.6	50.5	29.1	48.0	30.2	34.7	27.3	29.1														
Total Time (Secs)	Mn	77.9	92.5	83.8	95.4	65.1	77.9	87.3	78.2														
	Mdn	73.3	77.8	79.7	76.1	55.9	68.3	69.8	65.2		20.23	.01											
	SD	40.6	74.3	50.1	89.4	40.0	45.4	54.5	52.0														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

TABLE V—Frequencies of Scores on Card III According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	2	4	1	4	5	4	1	8	29			0	2	0	3	3	3	0	5	16		
	1	34	25	34	23	36	32	28	28	240	6.88	.50	24	17	18	18	15	19	18	18	147	2.74	.90
	2	18	22	19	27	21	20	23	26	176			9	15	12	17	15	11	15	16	110		
	3 or >	27	30	27	27	19	25	29	19	203			10	9	13	5	10	10	10	4	71		
W	0	73	72	72	76	69	65	73	62	562			39	40	40	41	36	36	37	32	301		
	1	7	7	9	4	12	14	7	18	78	16.18	.02	4	3	3	2	7	7	6	10	42	13.03	.05
	2	1	1	0	1	0	2	1	1	7			0	0	0	0	0	0	0	1	1		
	3 or >	0	1	0	0	0	0	0	0	1			0	0	0	0	0	0	0	0	0		
D	0	5	7	3	7	12	18	5	20	77			1	4	1	4	6	10	3	12	41		
	1	33	29	33	24	34	23	31	24	231	8.22	.30	24	19	18	19	16	14	18	17	145	5.58	.50
	2	19	17	22	24	16	19	21	21	159			10	11	13	16	11	12	14	11	98		
	3 or >	24	28	23	26	19	21	24	16	181			8	9	11	4	10	7	8	3	60		
Dd	0	76	73	75	75	79	75	68	73	594			41	41	41	42	43	39	41	42	330		
	1	5	8	4	3	1	5	9	7	42	10.49	.20	2	2	2	0	0	3	2	1	12	. . .*	
	2 or >	0	0	2	3	1	1	4	1	12			0	0	0	1	0	1	0	0	2		
S	0	75	71	72	78	73	75	78	71	593			42	40	40	42	40	39	42	39	324		
	1	6	8	8	1	7	5	1	9	45	7.77	.30	1	2	3	0	2	3	1	4	16	. . .*	
	2 or >	0	2	1	2	1	1	2	1	10			0	1	0	1	1	1	0	0	4		
M+FM+m	0	37	39	47	31	40	58	25	43	320			22	27	26	21	23	30	12	25	186		
	1	36	31	31	43	35	20	48	34	278	34.38	.001	19	13	16	22	16	12	30	18	146	17.88	.01
	2 or >	8	11	3	7	6	3	8	4	50			2	3	1	0	4	1	1	0	12		
T/1R (Secs)	Mn	21.7	25.5	27.3	18.6	20.2	26.7	19.0	20.3														
	Mdn	15.3	17.7	20.5	12.2	15.5	18.8	11.9	14.2		17.43	.01											
	SD	19.1	25.4	24.3	23.5	18.4	24.1	18.2	20.0														
T/R (Secs)	Mn	42.3	48.5	53.5	43.7	45.4	51.2	43.8	46.6														
	Mdn	38.2	38.4	39.0	36.4	41.3	46.3	37.2	36.8		3.80	.80											
	SD	20.9	33.8	38.3	28.9	30.1	31.4	26.3	32.4														
Total Time (Secs)	Mn	83.8	97.2	94.7	94.7	70.0	85.8	91.5	81.9														
	Mdn	74.5	78.7	81.4	79.5	59.2	72.6	69.9	66.1		10.37	.20											
	SD	56.2	65.8	62.2	73.5	36.5	46.7	71.2	54.8														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

*Expected frequencies less than 3

TABLE VI—Frequencies of Scores on Card IV According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	9	3	8	9	2	3	6	6	46			6	1	5	7	1	3	3	5	31		
	1	43	41	39	33	48	41	31	30	306	9.65	.20	23	26	24	20	25	26	23	18	185	2.79	.90
	2	13	20	18	20	13	20	18	27	149			6	11	9	10	7	8	8	13	72		
	3 or >	16	17	16	19	18	17	26	18	147			8	5	5	6	10	6	9	7	56		
W	0	30	29	33	35	28	24	38	19	236			17	15	15	21	16	12	21	9	126		
	1	43	40	42	33	47	45	36	41	327	13.73	.05	24	21	23	16	22	27	19	22	174	11.57	.10
	2	5	9	4	9	5	11	2	16	61			1	7	4	4	4	4	2	9	35		
	3 or >	3	3	2	4	1	1	5	5	24			1	0	1	2	1	0	1	3	9		
D	0	47	40	45	38	41	48	28	56	343			26	25	28	23	20	28	20	33	203		
	1	18	24	18	24	25	16	21	12	158	22.42	.01	7	13	12	15	17	9	11	8	92	13.01	.05
	2	11	9	9	12	8	14	22	8	93			8	1	1	4	3	5	10	2	34		
	3 or >	5	8	9	7	7	3	10	5	54			2	4	2	1	3	1	2	0	15		
Dd	0	73	75	77	71	72	68	69	66	571			40	42	41	40	39	39	38	41	320		
	1	6	2	2	5	6	11	9	9	50	10.83	.10	2	1	1	2	3	4	5	1	19	3.59	.80
	2 or >	2	4	2	5	3	2	3	6	27			1	0	1	1	1	0	0	1	5		
S	0	80	78	81	77	77	73	77	76	619			43	43	43	42	42	41	42	42	338		
	1	1	2	0	3	4	8	3	4	25	11.55	.10	0	0	0	0	1	2	1	1	5	. . .*	
	2 or >	0	1	0	1	0	0	1	1	4			0	0	0	1	0	0	0	0	1		
M+FM+m	0	65	71	75	66	54	63	75	61	530			37	38	40	39	25	30	43	38	290		
	1	12	8	6	12	27	17	6	15	103	28.80	.001	4	5	3	4	18	12	0	4	50	42.00	.001
	2 or >	4	2	0	3	0	1	0	5	15			2	0	0	0	0	1	0	1	4		
T/1R (Secs)	Mn	24.0	31.0	30.3	34.3	19.3	31.2	24.7	25.2														
	Mdn	16.2	19.9	23.7	21.5	15.1	21.1	18.6	13.4		15.92	.02											
	SD	22.0	33.7	25.3	41.4	15.7	33.2	20.0	37.4														
T/R (Secs)	Mn	46.9	55.8	54.0	58.0	41.3	55.2	44.7	44.0														
	Mdn	38.7	44.5	46.2	46.8	35.5	39.7	38.6	29.0		12.41	.10											
	SD	29.7	37.8	32.4	47.4	25.8	45.2	25.1	45.9														
Total Time (Secs)	Mn	73.5	88.8	87.5	96.2	60.4	84.8	91.7	72.7														
	Mdn	60.0	69.7	71.2	74.0	52.2	69.2	70.5	56.9		16.38	.02											
	SD	57.9	71.3	67.3	75.8	39.6	55.7	71.5	58.3														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

*Expected frequencies less than 3

TABLE VII—Frequencies of Scores on Card V According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	2	1	0	0	5	1	5	6	20			2	1	0	0	5	1	2	3	14		
	1	53	47	51	35	48	42	40	37	353	13.71	.05	30	31	30	21	22	26	27	23	210	9.41	.20
	2	14	19	17	21	17	23	16	21	148			7	8	10	15	13	12	10	10	85		
	3 or >	12	14	13	25	11	15	20	17	127			4	3	3	7	3	4	4	7	35		
W	0	17	12	7	21	18	15	14	18	122			10	7	6	13	13	6	6	8	69		
	1	51	59	63	49	51	57	53	43	426	9.61	.20	27	33	33	23	22	33	33	25	229	7.42	.30
	2	10	8	11	9	12	6	10	14	80			6	3	4	6	8	2	4	6	39		
	3 or >	3	2	0	2	0	3	4	6	20			0	0	0	1	0	2	0	4	7		
D	0	52	51	56	35	57	50	46	53	400			28	30	31	21	31	30	31	32	234		
	1	20	18	16	25	10	18	19	15	141	17.74	.01	12	10	9	16	6	11	7	7	78	9.14	.20
	2	5	5	7	10	10	10	11	10	68			2	2	3	4	5	2	4	4	26		
	3 or >	4	7	2	11	4	3	4	3	39			1	1	0	2	1	0	1	0	6		
Dd	0	52	51	56	35	57	50	46	53	400			42	41	42	39	41	40	42	42	329		
	1	20	18	16	25	10	18	19	15	141	17.80	.01	1	2	0	4	2	2	1	1	13	. . .*	
	2 or >	9	12	9	21	14	13	16	13	107			0	0	1	0	0	1	0	0	2		
S	0	79	77	80	81	79	76	79	80	631			43	43	43	43	42	41	43	43	341		
	1	2	4	1	0	2	4	1	1	15	. . .*		0	0	0	0	1	1	0	0	2	. . .*	
	2 or >	0	0	0	0	0	1	1	0	2			0	0	0	0	0	1	0	0	1		
M+FM+m	0	58	57	65	75	69	70	67	71	532			33	36	36	39	34	38	39	41	296		
	1	19	22	15	5	11	10	10	7	99	23.15	.001	9	7	7	4	8	4	3	1	43	9.20	.20
	2 or >	4	2	1	1	1	1	4	3	17			1	0	0	0	1	1	1	1	5		
T/1R (Secs)	Mn	17.8	22.3	15.9	16.0	17.9	20.0	16.8	16.4														
	Mdn	11.8	12.1	9.2	8.1	9.9	12.0	10.2	9.5		7.71	.30											
	SD	18.4	30.1	18.1	26.7	20.4	23.1	18.4	19.9														
T/R (Secs)	Mn	40.3	45.3	43.2	38.2	37.3	42.6	42.2	37.2														
	Mdn	33.9	35.0	35.5	28.4	28.5	32.7	37.6	28.0		13.41	.05											
	SD	27.3	36.6	26.6	33.2	28.2	32.2	26.5	30.6														
Total Time (Secs)	Mn	61.1	76.4	64.1	74.0	54.2	69.0	80.6	64.6														
	Mdn	50.5	54.4	51.6	54.8	45.2	53.7	56.1	46.5		2.35	.90											
	SD	48.4	67.9	52.4	64.4	42.1	50.4	82.0	53.7														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

*Expected frequencies less than 3

TABLE VIII—Frequencies of Scores on Card VI According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	13	8	10	11	11	5	11	6	75			11	4	6	8	6	4	9	3	51		
	1	41	34	43	30	46	43	30	44	310	10.62	.20	22	23	24	21	25	27	19	28	189	0.89	.99
	2	13	19	14	16	15	20	20	17	134			7	11	8	9	11	7	11	8	72		
	3 or >	14	20	14	24	9	13	20	14	129			3	5	5	5	1	5	4	4	32		
W	0	45	47	44	47	38	31	57	35	344			27	21	25	29	26	17	32	15	192		
	1	34	27	34	26	37	39	15	34	246	23.00	.001	15	19	18	10	13	21	7	23	126	21.12	.01
	2	1	6	3	5	5	7	6	10	43			0	3	0	3	4	3	4	4	21		
	3 or >	1	1	0	3	1	4	3	2	15			1	0	0	1	0	2	0	1	5		
D	0	37	29	40	35	47	42	25	44	299			22	18	22	23	21	26	18	28	178		
	1	27	28	23	16	23	26	26	25	194	17.97	.01	15	20	12	11	17	13	15	11	114	7.23	.30
	2	9	13	10	16	9	8	18	8	91			5	4	6	7	5	3	8	4	42		
	3 or >	8	11	8	14	2	5	12	4	64			1	1	3	2	0	1	2	0	10		
Dd	0	74	68	69	60	73	74	71	72	561			42	38	37	37	40	41	41	42	318		
	1	4	10	9	14	6	6	6	3	58	14.10	.05	1	5	4	6	3	2	2	1	24	7.82	.30
	2 or >	3	3	3	7	2	1	4	6	29			0	0	2	0	0	0	0	0	2		
S	0	81	80	80	81	81	80	79	80	642			43	43	42	43	43	43	43	43	343		
	1	0	1	1	0	0	1	1	1	5	. . .*		0	0	1	0	0	0	0	0	1	. . .*	
	2 or >	0	0	0	0	0	0	1	0	1			0	0	0	0	0	0	0	0	0		
M+FM+m	0	71	70	76	76	77	71	62	71	574			39	40	41	42	40	37	37	43	319		
	1	7	9	2	5	4	9	14	8	58	19.89	.01	3	3	1	1	3	6	6	0	23	11.18	.10
	2 or >	3	2	3	0	0	1	5	2	16			1	0	1	0	0	0	0	0	2		
T/1R (Secs)	Mn	27.1	35.9	29.3	34.8	22.5	34.6	30.7	24.3														
	Mdn	19.0	24.8	20.2	21.8	14.9	23.0	20.5	14.8		4.56	.70											
	SD	22.3	44.4	29.1	45.7	21.5	41.4	29.8	27.0														
T/R (Secs)	Mn	49.4	57.4	60.7	49.6	41.8	60.5	52.8	47.0														
	Mdn	42.8	47.4	48.3	38.4	34.7	44.8	43.8	39.2		14.70	.05											
	SD	31.6	47.7	40.0	34.5	29.3	50.3	39.6	32.0														
Total Time (Secs)	Mn	78.9	99.9	88.5	99.4	60.1	83.1	102.6	71.2														
	Mdn	65.5	72.6	75.1	76.3	47.7	69.8	72.6	54.8		22.07	.01											
	SD	66.8	90.3	67.9	82.4	42.7	52.8	121.4	59.8														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

*Expected frequencies less than 3

TABLE IX—Frequencies of Scores on Card VII According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	9	7	7	4	13	4	11	15	70			7	6	4	3	8	4	6	9	47		
	1	45	33	36	40	44	49	32	28	307	9.78	.20	24	23	22	24	21	26	20	21	181	2.50	.90
	2	14	24	18	17	14	18	20	19	144			8	10	10	12	10	8	13	5	76		
	3 or >	13	17	20	20	10	10	18	19	127			4	4	7	4	4	5	4	8	40		
W	0	35	37	30	47	41	29	30	32	281			17	16	21	27	20	15	15	16	147		
	1	38	32	37	31	34	42	30	26	270	13.91	.05	24	22	16	15	18	22	21	16	154	11.34	.10
	2	6	10	11	1	6	9	17	18	78			2	5	6	1	5	6	6	9	40		
	3 or >	2	2	3	2	0	1	4	5	19			0	0	0	0	0	0	1	2	3		
D	0	48	36	43	23	44	43	45	46	328			30	28	24	15	27	26	29	30	209		
	1	13	22	18	33	24	25	18	22	175	18.97	.01	4	9	9	19	11	12	6	11	81	16.46	.02
	2	12	17	13	11	8	8	12	10	91			7	6	8	5	2	4	7	2	41		
	3 or >	8	6	7	14	5	5	6	3	54			2	0	2	4	3	1	1	0	13		
Dd	0	79	71	75	71	77	76	76	75	600			43	40	41	41	42	40	43	43	333		
	1	1	8	2	5	1	4	3	6	30	3.96	.70	0	3	0	2	0	2	0	0	7	. . .*	
	2 or >	1	2	4	5	3	1	2	0	18			0	0	2	0	1	1	0	0	4		
S	0	75	72	74	71	75	71	69	73	580			40	40	43	40	40	39	38	42	322		
	1	5	9	6	9	5	8	10	8	60	3.62	.80	3	3	0	3	2	2	5	1	19	. . .*	
	2 or >	1	0	1	1	1	2	2	0	8			0	0	0	0	1	2	0	0	3		
M+FM+m	0	54	41	56	51	48	48	50	57	405			34	27	32	32	26	25	30	30	236		
	1	22	33	20	26	31	31	24	19	206	5.43	.50	8	14	10	11	15	17	12	10	97	5.13	.70
	2 or >	5	7	5	4	2	2	7	5	37			1	2	1	0	2	1	1	3	11		
T/1R (Secs)	Mn	25.8	31.9	29.2	24.5	27.8	30.5	24.8	23.7														
	Mdn	20.1	24.2	21.1	14.8	16.2	21.8	17.6	15.5		13.03	.05											
	SD	21.9	28.8	24.4	33.6	34.1	36.6	21.8	22.6														
T/R (Secs)	Mn	52.4	53.3	53.9	53.8	54.5	62.4	50.9	44.3														
	Mdn	45.0	45.5	47.5	42.6	39.6	46.6	43.0	33.6		10.88	.10											
	SD	33.8	34.3	32.6	40.3	51.2	50.4	32.2	33.5														
Total Time (Secs)	Mn	79.1	94.9	97.4	91.2	68.0	83.8	96.7	73.0														
	Mdn	62.4	72.7	77.7	64.4	53.4	68.0	69.7	63.1		13.51	.05											
	SD	68.2	77.1	87.0	72.1	51.7	56.9	101.5	54.5														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

*Expected frequencies less than 3

TABLE X—Frequencies of Scores on Card VIII According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	0	2	0	0	2	1	5	5	15			0	2	0	0	2	1	3	2	10		
	1	25	23	36	24	28	21	28	21	206	9.12	.20	13	16	21	18	15	14	21	16	134	6.45	.50
	2	31	25	25	26	30	34	18	23	212			19	13	14	14	16	16	10	12	114		
	3 of >	25	31	20	31	21	25	30	32	215			11	12	8	11	10	12	9	13	86		
W	0	48	48	44	51	53	53	37	37	371			29	27	24	27	27	32	19	18	203		
	1	28	28	35	24	24	26	30	31	226	14.92	.05	13	15	19	13	13	10	18	18	119	15.37	.02
	2	3	3	2	4	3	2	9	10	36			0	1	0	3	3	1	5	7	20		
	3 or >	2	2	0	2	1	0	5	3	15			1	0	0	0	0	0	1	0	2		
D	0	16	14	25	13	13	10	28	20	139			7	11	12	11	8	5	21	12	87		
	1	23	21	26	26	30	25	23	29	203	15.63	.02	13	11	17	13	18	16	12	20	120	16.78	.02
	2	22	27	16	25	25	31	17	20	183			15	12	8	14	11	16	7	9	92		
	3 or >	20	19	14	17	13	15	13	12	123			8	9	6	5	6	6	3	2	45		
Dd	0	70	74	69	57	71	71	65	69	546			40	42	39	34	36	38	40	38	307		
	1	7	3	10	16	7	8	10	6	67	16.90	.01	3	1	3	8	6	5	2	4	32	10.16	.20
	2 or >	4	4	2	8	3	2	6	6	35			0	0	1	1	1	0	1	1	5		
S	0	66	68	66	57	56	44	52	49	458			39	39	38	35	31	22	36	30	270		
	1	13	10	13	22	24	36	23	25	166	32.14	.001	4	4	4	8	11	21	7	12	71	32.98	.001
	2 or >	2	3	2	2	1	1	6	7	24			0	0	1	0	1	0	0	1	3		
M+FM+m	0	54	48	52	45	57	53	60	59	428			29	27	29	23	29	34	37	31	239		
	1	24	33	29	31	21	25	17	20	200	9.46	.20	14	16	14	19	12	9	6	12	102	13.70	.05
	2 or >	3	0	0	5	3	3	4	2	20			0	0	0	1	2	0	0	0	3		
T/1R (Secs)	Mn	22.4	24.0	21.6	21.2	17.7	22.9	25.4	21.8														
	Mdn	15.4	16.8	12.5	11.2	12.3	13.7	24.1	12.8		21.14	.01											
	SD	25.9	25.6	25.6	31.8	17.0	29.2	18.7	23.8														
T/R (Secs)	Mn	40.3	45.8	50.8	45.8	36.9	44.9	47.0	38.0														
	Mdn	33.8	38.9	45.5	33.2	29.0	30.1	40.5	27.8		22.30	.01											
	SD	31.7	26.3	30.4	40.2	25.5	41.0	33.2	30.4														
Total Time (Secs)	Mn	85.6	105.6	94.9	110.5	72.0	86.8	103.3	89.5														
	Mdn	68.6	85.5	74.9	71.3	56.2	70.5	70.5	69.2		5.01	.70											
	SD	69.6	81.2	78.3	151.1	55.5	61.6	109.1	85.6														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

TABLE XI—Frequencies of Scores on Card IX According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p	Matched Groups C (PC)	C (S)	A	CS	S	W	CF	F	Total	Chi-square	p
R	0	13	10	9	12	15	8	14	16	97			10	6	4	9	9	6	10	9	63		
	1	33	28	32	21	36	38	30	27	245	8.89	.20	17	20	20	18	18	18	18	22	151	3.46	.80
	2	17	18	17	18	15	18	15	22	140			10	11	11	6	7	11	9	8	73		
	3 or >	18	25	23	30	15	17	22	16	166			6	6	8	10	9	8	6	4	57		
W	0	49	45	56	70	44	41	49	41	395			29	19	33	36	20	20	25	20	202		
	1	26	31	23	7	29	31	28	31	206	33.71	.001	13	22	10	6	17	16	16	19	119	25.09	.001
	2	4	4	2	3	6	7	3	7	36			1	2	0	1	5	5	2	3	19		
	3 or >	2	1	0	1	2	2	1	2	11			0	0	0	0	1	2	0	1	4		
D	0	36	34	26	21	45	35	38	46	281			21	22	12	17	27	19	26	30	174		
	1	17	16	31	21	23	36	18	19	181	25.48	.001	10	11	23	14	10	21	10	11	110	22.24	.01
	2	16	15	14	21	8	5	9	10	98			9	7	5	8	2	2	3	2	38		
	3 or >	12	16	10	18	5	5	16	6	88			3	3	3	4	4	1	4	0	22		
Dd	0	72	69	56	61	64	64	60	59	505			41	41	31	35	37	35	36	37	293		
	1	4	7	20	10	13	11	14	12	91	13.80	.05	2	1	9	4	3	6	5	4	34	13.95	.05
	2 or >	5	5	5	10	4	6	7	10	52			0	1	3	4	3	2	2	2	17		
S	0	56	61	68	72	68	63	55	53	496			34	37	38	41	35	33	36	33	287		
	1	22	17	10	7	13	10	19	18	116	22.53	.001	8	6	5	2	8	6	6	7	48	8.14	.30
	2 or >	3	3	3	2	0	8	7	10	36			1	0	0	0	0	4	1	3	9		
M+FM+m	0	66	56	67	48	59	65	61	69	491			38	36	37	29	30	37	32	38	277		
	1	13	18	10	26	21	12	15	10	125	19.36	.01	4	6	6	14	12	5	10	5	62	13.91	.05
	2 or >	2	7	4	7	1	4	5	2	32			1	1	0	0	1	1	1	0	5		
T/1R	Mn	28.3	34.8	35.7	30.1	34.3	38.8	32.5	30.4														
(Secs)	Mdn	23.5	23.0	27.5	14.8	20.5	31.0	20.8	20.8		15.00	.05											
	SD	20.5	34.3	29.4	43.4	36.0	31.6	32.3	26.9														
T/R	Mn	50.9	58.6	60.2	48.0	53.2	59.9	58.9	48.3														
(Secs)	Mdn	41.8	46.3	53.0	40.1	46.1	45.9	45.5	38.4		4.80	.70											
	SD	29.8	42.7	36.0	35.7	37.4	45.1	47.5	31.8														
Total	Mn	98.9	108.0	107.3	113.2	75.2	99.1	110.0	91.5														
Time	Mdn	75.5	85.5	87.5	74.9	57.2	74.0	84.4	71.0		12.90	.05											
(Secs)	SD	96.0	90.0	81.5	147.7	58.9	85.1	112.3	83.4														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

TABLE XII—Frequencies of Scores on Card X According to Stimulus Series, and Summary of Time Data

Scoring Category	Score	Total Groups C (PC)	Total Groups C (S)	Total Groups A	Total Groups CS	Total Groups S	Total Groups W	Total Groups CF	Total Groups F	Total Groups Total	Chi-square	p	Matched Groups C (PC)	Matched Groups C (S)	Matched Groups A	Matched Groups CS	Matched Groups S	Matched Groups W	Matched Groups CF	Matched Groups F	Matched Groups Total	Chi-square	p
R	0	8	2	10	9	11	3	8	6	57	15.26	.02	7	2	8	8	8	3	6	4	46	6.60	.50
	1	13	16	19	9	14	20	13	20	124			6	14	11	7	7	13	8	16	82		
	2	12	22	19	8	19	17	13	10	120			6	14	10	3	10	11	10	4	68		
	3 or >	48	41	33	55	37	41	47	45	347			24	13	14	25	18	16	19	19	148		
W	0	52	57	57	58	56	58	60	51	449	3.15	.80	30	29	31	32	27	31	35	24	239	8.38	.30
	1	27	20	21	19	23	22	16	24	172			11	12	10	10	15	12	7	16	93		
	2	2	3	3	3	1	1	3	2	18			2	2	2	1	0	0	1	1	9		
	3 or >	0	1	0	1	1	0	2	4	9			0	0	0	0	1	0	0	2	3		
D	0	16	12	23	16	21	19	12	23	142	19.03	.01	10	11	17	12	13	13	8	17	101	8.73	.20
	1	12	15	15	6	16	9	14	13	100			5	10	8	4	9	6	10	9	61		
	2	10	16	15	10	15	20	20	16	122			8	10	6	5	9	9	12	6	65		
	3 or >	43	38	28	49	29	33	35	29	284			20	12	12	22	12	15	13	11	117		
Dd	0	75	79	71	66	67	57	51	44	510	74.94	.001	41	42	39	37	36	34	31	30	290	23.72	.001
	1	3	2	7	9	9	17	17	24	88			2	1	3	4	2	5	9	12	42		
	2 or >	3	0	3	6	5	7	13	13	50			0	0	1	2	2	3	3	1	12		
S	0	79	79	78	68	71	58	54	46	533	94.34	.001	41	42	41	38	38	32	32	32	296	25.85	.001
	1	2	2	3	6	8	19	18	23	81			2	1	0	2	3	4	8	9	39		
	2 or >	0	0	0	7	2	4	9	12	34			0	0	0	0	1	3	1	2	9		
M+FM+m	0	52	48	66	53	67	63	58	67	474	24.61	.001	31	32	38	29	36	34	35	39	274	11.91	.10
	1	15	13	10	16	10	15	13	10	102			6	5	4	4	4	7	8	4	49		
	2 or >	14	20	5	12	4	3	10	4	72			6	6	1	3	3	2	0	0	21		
T/1R (Secs)	Mn	25.7	26.9	38.4	29.8	26.6	42.7	25.9	28.7		11.03	.10											
	Mdn	20.5	14.5	27.5	14.2	18.8	24.2	19.4	20.8														
	SD	21.6	38.6	36.9	53.8	39.5	74.5	22.4	29.5														
T/R (Secs)	Mn	37.3	41.5	56.5	36.9	37.9	58.5	39.9	46.0		15.12	.02											
	Mdn	33.4	34.3	44.4	26.4	34.1	32.8	33.7	37.4														
	SD	21.9	32.1	42.5	31.9	24.7	91.6	30.6	35.3														
Total Time (Secs)	Mn	131.2	136.7	124.6	137.9	95.2	129.3	139.1	124.3		7.32	.30											
	Mdn	95.5	86.1	101.4	89.2	68.4	91.8	97.5	105.0														
	SD	135.0	133.4	111.8	190.2	81.8	124.5	135.0	106.1														
TOTAL	N	81	81	81	81	81	81	81	81	648			43	43	43	43	43	43	43	43	344		

in order to see how figure-ground reversals are affected by structural alterations within that card; by comparing the data from the several tables one can also see how basic form affects the pull for this kind of response. The other aspects of response can be examined in a similar fashion, thus making it possible to determine the pull of each card for various types of responses and the dependence of these responses upon structural properties of the blot. The discussion here, however, will be limited to the within card analysis and will be presented in summary form.

CARD I

R: Productivity was not affected by blot structure. Rejections occurred infrequently; only 16 of 648 *Ss* failed to give at least one response.

W, D, Dd: The location of responses was affected by blot structure, but not in a well defined manner. Most evident is the lower frequency of D responses on the line figures (CF, F). Also of interest is the fact that nine *Ss* gave three or more D responses to series S, but no *S* in group W gave as many as three D responses. Breaking down a white figure appeared to be more difficult than differentiation of a grey figure.

S: Space responses were also dependent upon blot structure with the line figures (CF, F) producing the greatest number of this type of response. The solid grey figure (S) least often led to figure-ground reversals.

M+FM+m: Projection of movement varied significantly as a function of structure. Again groups CF and F were most deviant, only two *Ss* out of 162 giving movement responses.

Time: Time properties of behavior did not vary significantly as a function of blot structure.

Summary: Significant variations in location and movement scores were due primarily to the inclusion of figures CF and F. Shading on card I did not affect the formal aspects of response, as can be determined by inspection of the data for the C, A, CS, and S stimuli[7].

CARD II

R: Blot structure affected productivity. Rejections were most frequent when the figure contained color or was constructed of lines. High productivity was most likely to occur when clearly delineated D areas were present, without color (i.e., CS and CF). CF was especially interesting in that, compared to the other stimuli, it tended to lead to either rejection or a high frequency of response.

W, D, Dd: The location of responses was extremely dependent upon blot structure. Color breaks up this blot so that whole responses were infrequently given to the C series compared to all of the other modifications. S, W, A, and F produced a high number of W responses while CS and CF were intermediate. The normal expectation on this card would be at least one whole response, if it were not for the fact that certain blot areas are colored. The fact that whole responses are much less frequent on CS than A, however, suggests that it is not color per se which is important but rather the fact that color is the method by which the standard blot is broken up into definite areas with well articulated forms.

S: Space responses were related to structure on card II, being especially frequent on F, W, and CF.

M+FM+m: Movement responses occurred most frequently when the figure was a relatively uniform whole (S, W) and least frequently when the figure had well articulated parts (CS,

[7] It is important to remember that the C and A stimuli are identical for cards I, IV, V, VI, and VII. Also, in considering the data in all tables, the reader should recognize that $C_{(S)}$ and $C_{(PC)}$ refer to identical test experiences for their *Ss* on *all* cards; only the inquiry differed for these two groups and thus did not affect the scores analyzed in this paper. In discussing the data reference will be made frequently to the C series, meaning $C_{(S)}$ and $C_{(PC)}$ combined.

CF, C). Content analysis in the next section will clarify this finding.

Time: Neither the latency of response nor the time per response varied significanty as a function of color, shading, or other blot properties. There was significant variation in the total time devoted to the blot, however. *Ss* in groups S returned the card more quickly than *Ss* in any other group; they also were satisfied with a single response to the blot more frequently than other Ss (53 Ss in group S gave but one response). Content analysis, location scores, and other data indicate that most *Ss* in this group saw the whole blot as two distinct humans; this perception tended to be immediate and it was so demanding that most *Ss* could or would not go ahead to consider other possible additional responses.

Summary: The data for card II are especially revealing in regard to how blot structure determines perception. The shape of the whole blot is very suggestive of a particular class of percepts, but the discontinuity between parts created by the juxtaposition of colored and achromatic areas makes it very difficult for most *Ss* to achieve total integration. Instead they tend to interpret part areas of the blot, which in turn affects other components of the response pattern. *Ss* who achieve the whole human response on the C series demonstrate an achievement in integration, overcoming color discontinuity, which most *Ss* can achieve only through the assistance of stimulus modification.

Card III

R: Significant effects on productivity on card III due to blot structure were not demonstrated.

W, D, Dd: Location scores were relatively consistent from series to series, except for a tendency toward a greater number of whole responses on those series which are uniformly grey or white (S, W, F).

S: No significant variation was demonstrated.

M+FM+m: Marked variation in frequency of movement responses occurred from series to series. CF was most likely to elicit at least one movement response while W was most likely to elicit no movement response.

Time: Time scores were not affected by blot structure, except for latency. T/1R tended to be longer when the figures were constructed of variable greys (A).

Summary: The effects of blot structure upon the formal properties of response were much less pronounced for card III than for card II; the variations noted were fewer and less extreme. Careful examination of Table V impresses one with the consistency of scores from series to series. The red areas on card II actually overlap with achromatic areas whereas on card III they are separated by a considerable amount of white space. This is a blot with "scattered" but well defined form areas, consequently response tends to be largely form directed.

Card IV

R: Frequency of response was not affected by structure; rejections did not occur more often due to shading.

W, D, Dd: The simple form series (F) tended to elicit the highest number of whole responses whereas CF and CS, with their accentuation of the center D area, provoked a relative increase in the number of detail responses. The frequency of Dd responses was not affected by structure.

S: Space responses were quite uncommon on any of the series. It is interesting, however, that the space response was most likely to occur on series W.

M+FM+m: The frequency of movement responses on card IV was quite dependent on structure; they were most common on the uniformly white or grey figures (S, W, F). Again, to anticipate the content analysis, it is on these three series that a whole human is most frequently seen, usually in motion. The shading and internal form structure on series A, CS, and CF

makes this integrated perception more difficult to achieve.

Time: Time patterns on card IV also tended to be affected by structure. Series S and F secured the quickest reaction times, the shortest average times per response and the lowest total times.

Summary: Variation due to structure appears to be of about the same order as that demonstrated on card III, although not identical in type. Shifts in location can be effected by accentuating internal detail areas or by eliminating them. When eliminated, integrated whole responses involving movement become more frequent. It is as if the diffuse shading in the standard card draws attention inward, making response to the general outline more difficult. Shading plays a role here comparable to that of color on card II, although the effect is not as pronounced. *Ss* are also able to deal more quickly with the simple form (S, F), except when it is white on black (W).

CARD V

R: Significant variation in productivity was obtained due to structure. CS tended to elicit high productivity most frequently, while rejections were most common on F, S, and CF. Again it is interesting to note that CF, while relatively high in rejections, was also high in the number of records with three or more responses.

W, D, Dd: The large majority of *Ss* in all groups gave at least one whole response to card V; structure had no significant effect. D and Dd responses did vary significantly between groups, however, with the CS series evoking the greatest number in each category. When productivity is controlled, between group variation is not significant.

S: Space responses on card V were quite rare, and frequently was not affected by the stimulus modifications.

M+FM+m: As on the previous four cards, movement scores varied significantly as a function of blot structure. Controlling for productivity, however, reduced the significance level from .001 to .20. For the total groups, movement was more frequent when the stimulus was shaded, i.e., series C and A.

Time: Time per response varied with blot structure, but the other two time measures did not show significant effects. There was a tendency for responses to take longer when the card was shaded (C, A) than when shading was elminated (CS, S).

Summary: The form quality of the total blot is so well defined that internal modifications do not significantly alter the tendency to give whole responses. Accentuation of part areas can, nevertheless, alter the frequency of detail responses even though they remain relatively infrequent. The significant variation in movement scores suggests that structure does affect content, since movement and content are intertwined. In addition shading tends to slow down the rate at which responses are formed.

CARD VI

R: The number of responses was not significantly affected by structure. The frequency of rejections was relatively high on all of the series.

W, D, Dd: Location scores were related to structure. The uniformly white series (W, F) tended to elicit more whole responses and fewer detail responses than the other series. CF led to an emphasis upon details and was difficult for most *Ss* to interpret as a whole.

S: Space response were extremely rare on card VI, being given by only 6 of 648 *Ss*.

M+FM+m: Significant differences between groups in movement scores were demonstrated by the total group analysis, but not by the matched group analysis. The trend was for movement to be projected more often on CF than on the other series.

Time: Initial response time was not significantly different across groups. The groups did differ, however, in the

amount of time taken per response and in total time. Responses were formed most quickly when the card was uniformly grey (S); also *Ss* in this group spent less time working on the card.

Summary: Card VI was not easy for most *Ss*, as shown by a total of 75 rejections. Shading per se, however, does not appear to be the critical factor. The massive, rather amorphous blot which suggests little activity and which does not lend itself to figure-ground reversals presents a difficult interpretive challenge. Although certain changes in response pattern can be effected by internal alterations of blot structure, the data indicate that card VI remains difficult because of its basic form.

Card VII

R: The rejection rate for card VII was high, but the data indicate that shading is not responsible for this. Variation in productivity was not significantly affected by structure.

W, D, Dd: Location of responses was related to blot structure, however. Comparison of the CS and S distributions with those for C and A suggests that shading may facilitate the whole response on card VII. Detail responses were most frequent on CS.

S: The center white area on this card is often pointed to when one wishes to illustrate figure-ground reversal. The data for groups C and A indicate that such a response is given by almost ten per cent of the *Ss*. In contrast to other cards, however, the frequency of this space response is not affected by blot structure.

M+FM+m: Movement scores were rather frequent on card VII, but this frequency was not affected by structure.

Time: Initial reaction time tended to be long when this blot was either shaded or when it was presented as a white figure on a grey background. Time per response did not show significant variation between groups, but *Ss* spent less time responding to S blots than to the other series.

Summary: The data support the interpretation that shading tends to increase response time as well as the number of whole responses on card VII. Of perhaps equal interest is the fact that structural properties, other than basic form, are not related to frequency with which figure-ground reversals occur.

Card VIII

R: Rejections of card VIII were infrequent; two-thirds of those which did occur were in response to the line figures (CF, F). Certainly the data do not support an inference that color leads to an inability to respond. Nor do the data indicate that overall productivity on this card is affected by structure.

W, D, Dd: Again location was not immune to structure effects. The line figures (CF, F) stimulated more whole responses, but color, in the direct sense, did not alter the frequency of the whole response. There is a suggestion, however, that the colored blot (C) evoked more detail responses than did the shaded blot (A). CF and F were also relatively low on detail responses. There was significant variation in minor detail responses, although the matched group analysis suggests that this may be a function of productivity level.

S: Space responses were comparatively common on card VIII; it is also clear that their frequency was significantly related to structure. Colored and shaded cards (C, A) had the lowest pulling power for this kind of response whereas the white figure (W) had the highest pulling power.

M+FM+m: The matched group analysis showed significant differences in movement responses although the total group analysis did not. The pattern of scores on both analyses is difficult to interpret.

Time: Initial response time varied significantly between groups. *Ss* were particularly slow to respond to the in-

tricate detail presented by the CF card. The data also suggest that color lengthened reaction time. Time per response was high on CF and A. Total time did not vary significantly as a function of structure.

Summary: Most facets of response to card VIII are affected by structure except productivity and time spent on the card. Effects upon movement, if any, are also minimal.

CARD IX

R: Rejections of card IX were very frequent, totalling about 15 per cent of all *Ss*. These rejections were evenly distributed over the eight groups, thus making it clear that basic form rather than color or shading is the primary factor involved. Overall productivity level was not significantly related to structure.

W, D, Dd: Marked differences in the location of responses were demonstrated. Color appeared to facilitate whole responses as evidenced by the finding of more such responses on the C series than on A and CS. *Ss* less frequently broke down the S and F blots into detail responses. Minor details were least frequently given by the C groups.

S: Space responses were frequent on card IX, being given by almost one out of four *Ss*. The total group analysis showed that this type of response was related to structure. The line figures (CF, F) pulled more space responses than did the other stimuli, but they were followed closely by the colored blot. The achromatic (A) and silhouette (CS, S) blots were less provocative in this regard while W was intermediate. These differences are washed out, however, when the groups are matched on R.

M+FM+m: Significant differences in movement were obtained, *Ss* in the CS group being most likely to give at least one such response.

Time: Two of the three time measures varied significantly. Initial response time was relatively fast on CS, relatively slow on W. *Ss* also devoted the least amount of time to the S blot.

Summary: The pattern of structural effects was similar to that identified on earlier cards. Perhaps of most interest is the fact that the high rate of rejections found on this blot is independent of structural attributes other than form.

CARD X

R: There was significant variation in productivity on card X due to structure. Group A was relatively low on R whereas group CS was relatively high.

W: Whole responses on card X were infrequent, and it is interesting that the several structural modifications had no significant effects upon the frequency of such responses. In contrast, D and Dd distributions were affected by structure. Three or more detail responses occurred most often on the CS and C series. Minor details, however, were rarely given on the C series but were quite frequent on the line series (CF, F) and the white series (W).

S: Space responses showed significant variation, being high on the white (W) and lined (CF, F) series and relatively low on the remaining series.

M+FM+m: Movement responses were more frequent on the C, CS, and CF blots than on the other stimuli.

Time: Variations in initial time and total time were not significant, but time per response was affected by structure. The latter was due largely to lengthened times on series A.

Summary: Productivity tended to be low on A and time to form responses was long. In addition the number of detail responses was less on A than on C. Integrating the findings suggests that color facilitates efficient and productive response to card X. When shaded, without color the blot is less easily broken down into discrete responses.

RESULTS III: CONTENT ANALYSIS

The final analysis was directed to the question of how blot structure influences the content of responses. Table XIII has been prepared in order to

present a detailed summary of this analysis.

The content of each response was classified using Beck's (6) system. Specific categories within these generic classes were also noted in the initial tabulation. For example, "bird" was recorded as a separate category on card I as well as being included in the total number of animal responses. If five *Ss* in any one of the eight groups gave a specific response (such as bat, witches, bow tie) to a specific blot area, then that response is listed separately under the generic term in Table XIII. Specific responses not given by at least five *Ss* in one series are not listed separately but do contribute to the total number of responses in the general class. Also it should be noted that only those general classes are retained in the table which were used by five or more *Ss* in at least one group.

In addition the following points should be made with regard to Table XIII:

1. If a general or specific content category is not listed this means that fewer than five *Ss* gave such a response in each of the eight groups.

2. If no specific categories are listed under a general content heading this means that responses were sufficiently variable so that no specific content was given by as many as five *Ss* in any one group.

3. Responses are listed with reference to the area of the blot used, whole (W), major detail (D), or minor detail (Dd). All of Beck's D areas are listed in the table, but only those Dd areas are listed which were responded to by at least five *Ss* in any one group.

4. For each location area figures are listed opposite TOTAL. These entries indicate the number of responses given to the area by all *Ss* in that group. For example, there were 99 whole responses given by *Ss* in group A on card I. Total figures include those responses given too infrequently to earn separate listing in the table.

5. Some areas (e.g., D1 on card I) have only TOTAL entries. This means that no content category was used sufficiently frequently (i.e., by five *Ss*) to merit separate listing. The numbers then simply indicate the frequency with which that area was interpreted on the various series.

6. For some responses a specific content is placed in parentheses following the more general class (e.g., geography, map on card I). This indicates that all responses of the general class were in fact limited to the specific content thus indicated.

7. At the end of the data for each card there is a listing opposite TOTAL R. These entries indicate the total number of responses given to the card by each group. They include responses given too infrequently to be listed separately in the table.

8. The reader, in using Table XIII, should also hold in mind that cards I, IV, V, VI, and VII are identical for groups $C_{(PC)}$, $C_{(S)}$, and A.

A final point needs to be made with regard to the construction of Table XIII compared to Tables II-XII. The latter tables contain data based upon scores as ordinarily assigned on the Rorschach. For example the response to card I, "Two persons (D2) pulling on another person (D4)" would be scored as a single whole response. For the content tabulation, however, such a response would be listed in Table XIII as a whole response, but the humans would also be given separate listings under D2 and D4 in order to show that these areas were given separate articulation by *S*.

Table XIII is intended to be used as a reference; the frequency distributions may be referred to as a source of information regarding the stimulus correlates of particular responses that are of interest. They also assist in defining the relative frequency of individual responses as well as the frequency with which various blot areas are utilized. No attempt will be made here to interpret all of the information in this table, but a few points regarding each card will be listed in summary form according to the area of the

TABLE XIII—Frequency of Content According to Card Area and Stimulus Series

Beck Area	Content	Card I C (PC)	Card I C (S)	Card I A	Card I CS	Card I S	Card I W	Card I CF	Card I F
W	Anatomy	3	11	7	1	1	0	2	1
	Animal	64	74	60	49	44	33	33	41
	Bat	38	39	27	20	23	15	6	11
	Bird	1	4	7	5	3	2	0	3
	Butterfly	18	17	10	14	6	8	3	7
	Head	0	3	4	3	1	2	13	6
	Rug or Skin	1	2	2	1	0	3	8	2
	Art	2	3	6	3	7	3	4	3
	Emblem	1	3	2	0	6	1	0	1
	Geography (Map)	6	14	4	18	9	14	54	51
	Human	3	4	4	8	15	16	7	4
	Persons, 2 or 3	0	2	0	7	8	8	0	0
	Witches, 2	1	1	0	0	7	5	1	0
	Ink	6	5	5	3	1	1	0	2
	Landscape	2	5	2	1	0	6	4	5
	Body of Water	1	1	1	0	0	4	4	5
	Mask	3	1	5	5	3	3	16	7
	TOTAL	94	125	99	92	84	84	123	119
D1	TOTAL	3	3	5	4	4	2	2	4
D2	Animal	3	5	3	4	2	3	3	3
	Geography (Map)	1	2	1	8	0	0	5	2
	Human	4	4	1	22	28	27	3	2
	Person	2	2	0	8	5	13	0	0
	Witch	2	2	1	11	23	14	2	1
	TOTAL	10	14	13	37	30	30	11	7
D3	Human	7	5	8	0	0	0	0	0
	TOTAL	7	7	9	0	0	0	0	0
D4	Anatomy	0	1	6	4	0	1	0	1
	Animal	7	6	8	3	23	12	0	0
	Cat	2	0	0	0	12	4	0	0
	Dog	0	1	0	0	7	2	0	0
	Insect	4	4	5	2	0	1	0	0
	Household	0	0	0	5	0	0	0	1
	Human	10	12	8	9	5	11	1	0
	Person, 1	10	10	5	6	5	9	1	0
	Persons, 2	0	2	3	3	0	2	0	0
	TOTAL	17	19	24	22	28	24	1	2
D5	TOTAL	1	0	1	2	3	2	3	3
D6	Human (Head)	1	0	0	5	6	3	2	0
	TOTAL	1	0	0	5	6	3	2	0
D7	Animal	3	1	1	1	7	2	7	6
	Head	2	0	1	1	4	2	6	6
	TOTAL	4	3	1	5	7	3	8	9
D8	TOTAL	5	4	4	4	5	2	4	4
D9	TOTAL	1	2	1	1	1	0	0	1
Dd23	Geography (Islands)	2	3	1	4	4	19	15	2
	TOTAL	2	3	2	4	5	22	15	3
Dd24	Music (Bell)	0	0	0	9	0	0	0	0
	TOTAL	2	0	1	13	0	0	0	0
Dds26	Geography (Islands or Lakes)	2	6	2	6	3	5	11	28
	TOTAL	2	7	3	6	3	5	12	28
Dd31	Animal (Head)	0	0	0	0	5	1	0	2
	TOTAL	0	0	0	1	7	3	1	3
Upper ½ of D4	Anatomy	5	2	2	0	0	0	1	0
	TOTAL	7	4	6	2	1	3	1	1
Top ½ of W	Animal (Winged)	5	3	0	1	1	2	0	0
	TOTAL	6	3	0	1	1	2	0	0
Lower ½ of D2	Geography	2	0	1	1	1	4	3	5
	TOTAL	3	2	2	1	2	5	4	5
	TOTAL R	176	202	184	216	200	198	214	198

Beck Area	Content	Card II C (PC)	Card II C (S)	Card II A	Card II CS	Card II S	Card II W	Card II CF	Card II F
W	Anatomy	2	6	5	3	2	1	5	4
	Animal	8	15	26	16	14	14	35	12
	Bears, 2	3	3	6	2	1	0	2	0
	Butterfly	2	4	0	0	2	4	11	2
	Chickens, 2	1	1	7	1	1	1	3	2
	Crab	0	1	0	1	0	1	11	0
	Art	3	3	0	1	1	1	6	3
	Geography	2	1	0	2	0	0	8	8
	Human	9	3	36	28	67	62	23	47
	Persons, 2	8	3	35	25	66	56	23	42
	Face	0	0	0	0	1	4	0	5
	Mask	0	1	0	0	0	4	0	5
	TOTAL	31	36	70	53	87	86	82	85
D1	Animal	40	38	13	25	1	1	1	1
	Bears	13	8	7	0	0	1	0	0
	Dogs	9	11	3	10	0	0	0	0
	Heads	5	5	0	14	0	0	0	0
	of dog	0	0	0	10	0	0	0	0
	TOTAL	47	46	16	28	1	1	4	1
D2	Animal	6	10	8	4	2	3	16	3
	Heads (of birds)	0	0	5	0	0	0	1	1
	Winged	3	6	0	0	0	1	3	0
	Blood	4	9	0	0	0	0	0	0
	Human	4	1	3	21	0	3	5	3
	Feet	0	0	2	9	0	0	0	0
	Hands	1	0	0	11	0	0	0	0
	Heads	3	0	0	1	0	2	5	3
	TOTAL	23	32	13	27	3	7	24	8
D3	Animal	8	14	7	15	2	1	14	3
	Butterfly	5	12	1	10	2	0	10	1
	Blood	2	10	0	0	0	0	0	0
	Botany	0	0	0	5	0	0	0	0
	Fire	5	4	0	0	0	0	4	0
	TOTAL	20	32	10	21	3	2	21	3
D4	Architecture	1	0	2	9	1	1	3	0
	Botany (Tree)	0	0	0	0	1	5	0	2
	Implement	1	3	3	5	0	0	2	0
	TOTAL	9	6	6	21	3	9	9	4
Ds5	Animal	1	1	0	0	0	1	4	5
	Household (Lamp)	1	0	2	7	7	6	10	5
	Recreation (Top)	0	1	0	1	1	5	1	7
	TOTAL	7	10	5	11	10	18	28	25
D6	Anatomy	2	6	0	3	0	0	1	0
	TOTAL	9	15	4	5	1	0	3	1
D7	TOTAL	0	1	0	2	0	0	0	0
Dd25	Nature (Icicle or Stalagmite)	1	1	5	0	0	4	4	5
	TOTAL	4	1	7	0	3	8	6	7
Dds29	Botany (Tree)	0	0	0	0	0	5	0	1
	TOTAL	0	0	0	0	0	6	0	5
Dds30	TOTAL	0	0	2	2	1	10	1	4
D2 + D3	TOTAL	6	3	0	0	0	0	0	0
Dds in Dd24	TOTAL	0	0	0	5	1	3	0	7
Dd between D1 and D2	TOTAL	0	0	0	11	0	0	0	0
	TOTAL R	166	186	148	200	123	156	193	161

TABLE XIII — *(Continued)*

Card III

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Geography	0	1	0	2	0	0	4	11
	Human (D1 elaborated)	5	2	0	0	2	6	1	4
	TOTAL	8	13	7	3	11	15	9	19
D1 and D9	Animal	12	14	9	10	3	8	5	3
	Birds	4	4	4	0	1	5	0	1
	Dogs	3	3	3	6	0	0	0	0
	Human	54	48	48	55	49	42	68	46
	∧ Persons	50	46	47	52	48	40	67	46
	∨ Persons	4	2	1	3	1	2	1	0
	TOTAL	74	70	62	66	52	53	73	49
D2	Anatomy	10	2	6	1	0	5	2	5
	Stomach	7	2	3	1	0	0	1	3
	Animal	2	10	14	17	12	13	13	15
	Birds	0	3	3	4	4	12	6	7
	Monkeys	1	4	4	5	3	0	0	3
	Blood	2	5	0	0	0	0	0	0
	Botany	0	2	5	8	5	4	3	3
	Human	1	2	1	4	5	1	1	3
	TOTAL	20	24	29	36	27	26	28	32
D3	Anatomy	10	8	5	3	3	8	4	2
	Bony	2	7	1	2	3	6	1	1
	Visceral	8	1	4	1	0	2	3	1
	Animal	12	11	17	14	27	14	12	15
	Butterfly	11	10	15	12	27	13	10	12
	Clothing (Bow or tie)	9	12	11	23	5	2	5	2
	TOTAL	36	35	35	43	38	27	26	23
D4	Human (Head)	1	1	2	5	0	0	0	0
	TOTAL	4	6	7	14	1	0	3	0
D5	Botany (Tree Limb)	4	5	2	0	2	1	1	0
	Human (Arm or Leg)	5	3	0	2	0	1	7	0
	TOTAL	12	12	6	8	5	8	10	2
D6	Human (Head)	0	0	1	1	3	3	3	5
	TOTAL	2	4	2	5	4	4	6	8
D7	Anatomy	4	3	8	3	5	4	1	0
	TOTAL	6	6	11	9	14	16	2	9
D7 as part of D1	Fire	5	4	0	5	7	5	24	16
	Household (Pot-like)	9	10	5	10	20	16	3	5
	Music (Drums)	6	5	1	3	3	4	0	1
	TOTAL	23	23	10	20	30	25	27	22
D8	TOTAL	4	5	3	2	0	1	1	1
D9	(See D1 above)								
D10	Clothing (Shoe)	0	3	5	4	0	1	5	0
	TOTAL	2	3	7	6	0	2	6	0
D11 and D12	Animal	5	3	2	5	5	8	3	4
	TOTAL	5	3	5	9	7	9	5	9
D1 + D3	TOTAL	2	5	5	0	8	5	3	6
D4 + D11	TOTAL	0	2	0	2	0	0	7	0
Dd (Neck area of D1)	Clothing (Collar)	0	0	0	1	0	0	6	0
	TOTAL R*	194	201	191	215	179	177	202	171

*(Does not include D7 as part of D1)

CARD IV

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Anatomy	7	3	3	0	0	1	3	0
	Animal	40	44	37	29	17	19	29	33
	Ape-like	6	5	2	2	4	7	7	1
	Bat	2	6	4	2	0	0	5	13
	Skin of Bear	15	16	16	7	4	2	7	8
	Botany	5	8	9	6	4	1	6	5
	Plant	3	10	3	9	6	9	12	10
	Tree	2	7	0	1	1	3	5	1
	Geography (Map)	1	3	3	8	5	6	7	9
	Human	1	3	0	2	0	2	6	6
	TOTAL	3	4	6	17	32	28	8	32
D1	Animal	62	72	55	63	60	69	69	89
	Head	10	14	8	0	6	6	0	5
	TOTAL	6	9	6	0	0	0	0	0
D2	Animal	11	18	13	3	9	9	0	6
	Clothing (Shoes)	0	3	2	3	0	0	5	2
	Human (Feet)	1	4	3	1	11	7	2	3
	TOTAL	3	2	2	4	4	5	0	1
D3	Botany (Flower)	5	11	7	12	15	13	11	6
	TOTAL	3	4	5	0	0	1	0	0
D4	Animal	5	8	7	2	1	1	0	1
	Head (of Bird)	7	11	8	8	10	4	14	12
	< Head (of Bird — Including Dds 31)	2	6	1	1	4	3	6	3
	Snake	0	0	2	0	0	1	7	6
	TOTAL	2	0	2	7	2	0	0	1
D5	Anatomy (Spine)	12	14	13	10	11	8	16	12
	Animal	1	10	4	1	0	0	0	0
	Botany (Tree Trunk)	0	1	1	6	0	0	2	0
	Household	1	0	0	3	0	0	30	0
	Human	0	0	0	4	0	1	8	0
	Arm or Leg	0	0	0	11	2	4	14	3
	TOTAL	0	0	0	0	0	0	9	0
D6	Clothing (Boots)	2	11	6	29	4	5	61	3
	TOTAL	5	1	9	0	9	3	0	1
D7	TOTAL	8	3	11	2	13	6	0	2
D8	Animal	1	1	2	4	0	0	1	0
	Heads (of Dogs)	3	1	1	9	3	6	3	8
	TOTAL	1	0	0	8	3	4	1	6
Dds24	TOTAL	4	2	3	10	5	6	5	9
Lower part of D1	Animal	0	0	0	2	0	5	1	0
	(Head)	0	0	0	0	0	2	0	8
	TOTAL	1	0	0	1	0	3	1	8
W minus D1	Animal	5	1	1	1	0	2	1	3
	Human	0	1	1	4	5	6	1	3
	TOTAL	5	2	2	5	5	8	2	6
Lower ½ of W	Animal	2	1	1	0	3	2	0	6
	Winged	1	1	1	0	3	1	0	5
	TOTAL	2	1	1	0	3	2	0	6
	TOTAL R	136	165	132	160	147	146	190	164

TABLE XIII — *(Continued)*

Card V

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Animal	74	80	95	75	77	73	86	74
	Bat	16	28	36	25	20	13	21	25
	Bird	5	8	9	6	9	6	11	7
	Butterfly	35	31	38	37	37	36	36	25
	Insect	6	1	5	6	6	2	5	3
	Moth	5	6	1	1	1	7	4	1
	Geography	0	2	1	1	0	3	3	11
	Human	2	2	2	3	4	6	5	4
	D7 elaborated	1	2	2	3	3	4	5	2
	TOTAL	84	95	100	86	82	83	101	95
D1	Animal	3	0	2	0	3	3	7	2
	Leg	3	0	2	0	2	2	7	2
	Human (Leg)	1	3	4	8	0	2	0	0
	TOTAL	4	4	6	10	3	7	7	2
D2 and D8	Animal	2	0	0	4	6	0	6	2
	Ears	0	0	0	2	2	0	6	2
	Human	2	7	5	22	6	1	2	4
	Legs	1	5	4	22	5	1	2	4
	TOTAL	5	8	7	26	13	2	10	7
D3 and D9	Animal	3	4	5	3	5	3	6	7
	TOTAL	5	4	7	9	10	5	12	13
D4	Animal	1	1	0	2	1	5	2	6
	TOTAL	6	4	6	6	5	5	5	6
D5	TOTAL	1	3	3	1	2	0	0	0
D6	Animal	0	5	0	1	5	4	1	5
	Head (Rabbit)	0	2	0	0	2	3	0	5
	TOTAL	0	6	0	1	5	5	3	6
D7	Animal	9	5	9	0	6	15	4	11
	Rabbit	3	2	4	0	4	10	1	8
	Human	5	7	2	18	3	5	5	2
	TOTAL	14	12	12	19	9	20	11	13
D8	(See D2 above)								
D9	(See D3 above)								
D10	Animal	1	2	1	0	2	3	6	9
	Head (Alligator)	1	2	0	0	1	3	1	5
	TOTAL	2	6	1	0	2	4	7	9
D11	TOTAL	4	3	0	0	2	1	2	0
Dd23	Human (Face)	1	1	1	5	0	0	3	1
	TOTAL	1	1	1	5	1	0	3	1
Dd30	Human (Head)	1	0	0	13	0	0	2	0
	TOTAL	1	1	0	13	0	0	2	0
Cut-off W	Animal	9	4	8	16	0	5	10	1
	Bat	3	4	0	5	0	0	4	0
	Butterfly	4	0	3	11	0	3	3	0
	Human (D7 elaborated)	2	1	0	7	0	1	1	0
	TOTAL	11	7	8	25	0	8	11	1
	TOTAL R	144	160	156	206	141	152	177	160

Card VI

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Animal	27	26	32	27	35	29	16	36
	Cat	2	1	0	2	12	7	0	19
	Dog	1	0	0	0	1	6	0	2
	Skin	15	10	18	14	20	13	4	13
	of bear	5	5	0	7	9	6	1	3
	of cat	1	1	6	3	7	4	0	4
	Turtle	3	5	3	5	0	0	1	0
	Winged Animal	0	4	5	1	0	1	8	0
	Botany	4	3	0	6	5	9	3	4
	Flower	2	2	0	1	2	5	3	1
	Tree	2	1	0	5	3	4	0	3

Card VI (Continued)

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
	Human	0	2	1	2	5	9	3	6
	Landscape	4	2	2	0	1	6	1	0
	TOTAL	40	43	39	45	50	62	36	60
D1	Animal	14	20	17	7	5	8	6	4
	Skin	14	20	16	7	4	4	5	3
	of bear	7	6	10	2	2	3	2	2
	Human	1	2	2	1	1	0	8	7
	∧ Person(s)	0	1	0	1	0	0	7	2
	V Person(s)	1	1	2	0	1	0	1	5
	TOTAL	22	27	26	12	11	16	16	19
D2	Human	2	3	2	1	0	0	14	0
	TOTAL	8	8	5	12	0	0	15	1
D3	Animal	18	18	6	2	11	9	4	8
	Bird	5	2	0	0	0	0	2	0
	Head (of cat)	1	2	1	2	9	7	1	6
	Insect	6	6	2	0	1	0	1	0
	Botany	0	0	1	0	2	5	0	1
	Human	0	1	0	1	1	1	6	1
	TOTAL	21	20	9	3	15	18	19	14
D4	TOTAL	3	3	4	5	2	4	3	0
D5	Household	0	0	1	5	0	0	5	0
	Candles	0	0	1	0	0	0	5	0
	Post	0	0	0	5	0	0	0	0
	TOTAL	3	8	4	12	0	0	11	0
D6	TOTAL	4	2	4	7	0	1	4	3
D7	TOTAL	3	3	4	3	1	2	3	3
D8	Animal (Cat)	0	0	0	0	4	2	0	6
	TOTAL	3	6	1	7	11	12	4	12
D9	Animal	6	3	5	10	5	4	6	6
	Head (of dog)	4	3	3	8	4	2	2	5
	TOTAL	6	4	6	12	8	5	7	6
D10	TOTAL	1	1	0	0	0	1	0	0
D11	TOTAL	1	2	1	7	0	0	3	0
D12	Household (Clothespins)	0	0	0	2	0	0	6	0
	Human (Legs)	0	0	0	4	0	0	5	0
	TOTAL	1	2	2	14	0	0	18	0
Dd21	TOTAL	4	3	1	4	1	1	0	5
Dd26	Animal (whiskers)	2	2	4	12	2	1	1	2
	TOTAL	2	2	4	13	2	1	3	3
Dd31	TOTAL	1	2	2	1	0	0	5	0
W minus D6	TOTAL	4	5	2	4	0	1	4	0
W minus lateral part of D1	Anthropology (totem pole	0	1	0	0	0	0	6	0
	TOTAL	0	2	1	2	1	0	6	1
Lower part of D2	TOTAL	0	0	0	5	1	0	2	1
	TOTAL R	134	158	124	177	110	131	165	137

Card VII

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Animal	12	16	16	5	5	8	16	7
	Dogs	5	9	4	3	3	1	4	2
	Clothing	0	1	0	1	0	5	4	14
	Collar	0	1	0	1	0	2	3	11
	Clouds	9	9	12	0	2	2	0	0
	Geography (Map)	9	8	7	8	1	5	12	9
	Household	1	0	3	2	8	5	3	10
	Chair	0	0	3	2	5	4	3	10
	Human	18	6	7	14	24	30	28	24
	∧ Figures, 2	14	4	2	8	21	25	16	18
	V Girls, 2	4	2	5	6	3	5	12	6
	Landscape	0	2	6	4	0	0	4	1
	TOTAL	58	59	70	42	47	62	76	75

TABLE XIII — *(Continued)*

Card VII (Continued)

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
D1	Animal	10	8	3	4	1	4	3	0
	Heads	5	3	1	2	1	3	2	0
	Human	2	3	4	17	7	5	5	5
	Heads	2	3	4	17	5	4	5	4
	TOTAL	14	14	9	24	8	12	10	6
D2	Animal	12	13	12	6	6	4	13	14
	Dogs	7	8	4	3	5	2	5	9
	Human	8	10	11	21	21	16	8	10
	∧ Persons, 2	2	6	8	17	18	14	6	10
	∨ Persons, 2	6	4	3	4	3	2	2	0
	TOTAL	23	30	29	29	28	23	24	28
D3	TOTAL	3	2	8	9	0	2	1	3
D4	Animal	6	3	7	8	0	0	0	0
	Butterfly	5	2	7	6	0	0	0	0
	TOTAL	16	7	11	11	4	6	3	8
D5	TOTAL	4	2	3	3	1	3	4	3
D6	TOTAL	5	5	3	10	2	0	8	0
Ds7	TOTAL	2	4	2	4	4	8	6	4
D8	TOTAL	6	5	1	1	2	2	2	3
D9	TOTAL	1	0	2	0	0	0	1	0
D10	Animal	4	4	6	4	1	0	0	0
	TOTAL	4	4	6	5	1	0	0	0
D11	Animal (Head or Skull)	0	0	0	0	0	0	5	0
	TOTAL	2	3	0	3	0	0	10	0
Dd21	TOTAL	2	2	3	6	2	1	3	3
	TOTAL R	143	147	157	164	107	126	151	135

Card VIII

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Anatomy	8	5	1	7	5	6	7	8
	Animal	17	15	35	24	18	17	25	15
	Insect	0	0	0	0	0	1	8	0
	Sea	1	1	2	2	2	2	5	2
	D1 elaboration of two animals	16	14	32	22	16	13	12	12
	Art	2	6	3	2	2	2	2	3
	Botany	3	0	2	0	0	2	5	4
	Geography	0	1	0	3	1	0	8	5
	Human	0	0	0	3	3	1	5	4
	Landscape	3	3	0	0	0	0	4	6
	TOTAL	40	39	42	41	33	30	66	56
D1	Animal	74	73	77	76	63	68	44	48
	Bear	14	11	22	24	19	13	12	10
	Cat-like	5	4	10	18	11	20	14	10
	Dog-like	6	5	5	10	9	8	2	13
	Rat	9	7	17	6	6	5	0	1
	Rodent (various types)	21	21	12	4	6	6	2	3
	TOTAL	74	74	77	76	63	69	45	50
D2	Animal	4	7	0	2	0	4	0	0
	Butterfly	3	7	0	2	0	1	0	0
	Botany	5	9	0	1	2	0	2	3
	Flower	5	7	0	1	1	0	1	0
	Food	9	11	2	1	0	0	0	0
	IceCream	9	11	0	0	0	0	0	0
	Landscape	17	13	28	10	6	0	3	3
	TOTAL	32	44	30	16	11	5	5	8
D3	Anatomy	11	17	15	20	23	37	16	27
	Ribs	11	17	14	17	22	35	14	26
	TOTAL	13	19	19	24	24	39	20	28
D4	Animal	1	2	1	0	5	2	0	6
	Sea	0	1	1	0	5	1	0	2
	Botany	8	0	4	5	4	5	2	4
	Tree	3	0	4	5	4	5	2	4

Card VIII (Continued)

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
D4	Landscape (Mountain)	3	2	2	2	1	4	12	13
	TOTAL	13	4	8	8	10	11	16	24
D5	TOTAL	5	4	1	5	2	3	2	2
D6	Animal (Head)	1	1	0	2	5	1	0	0
	TOTAL	8	6	4	6	7	1	2	0
D7	TOTAL	7	9	5	13	0	0	3	0
D8	Botany (Tree)	2	1	2	2	6	5	6	10
	TOTAL	5	9	7	4	10	8	12	14
Dd24	TOTAL	0	0	0	5	1	4	1	3
Dd26	Animal (Head)	0	1	3	8	2	0	4	5
	TOTAL	3	3	4	13	4	3	6	6
Dds28	TOTAL	2	0	0	1	0	3	8	5
Dds32	TOTAL	0	1	0	0	0	0	0	5
W minus D1	Anatomy	4	5	10	15	9	6	3	0
	TOTAL	8	9	11	17	15	11	9	5
Dds lateral to D3	TOTAL	1	0	1	0	0	1	3	5
	TOTAL R	231	233	224	250	192	195	215	221

Card IX

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Animal	3	1	8	1	9	6	12	15
	Center face elaborated	0	0	5	0	3	1	1	11
	Sea insect	1	1	3	1	3	1	7	1
	Art	6	12	1	2	4	0	2	3
	Botany	5	1	1	2	4	3	1	0
	Fire (explosions)	2	7	2	0	1	1	1	1
	Geography	1	1	0	0	1	0	3	7
	Household (Vase)	1	3	0	1	2	5	1	1
	Humans	1	3	4	3	13	13	8	11
	∨ Person	0	0	0	0	3	2	1	5
	∧ 2 Persons	0	1	0	1	1	8	5	2
	Landscape	5	2	4	0	0	1	0	0
	Mask	0	1	0	0	4	3	1	5
	Nature	3	5	1	1	1	1	0	1
	TOTAL	41	47	26	14	47	46	32	48
D1	Animal	5	3	5	2	2	1	4	0
	Human	2	1	1	32	3	0	2	1
	> Porson	2	1	1	9	3	0	2	1
	∧ Person	0	0	0	23	0	0	0	0
	TOTAL	15	6	11	37	5	1	7	2
D2	Animal (Deer-like head)	10	18	4	0	0	0	0	0
	TOTAL	14	19	5	0	0	0	1	0
D3	Animal	5	2	1	2	0	3	2	0
	Human	11	8	11	29	15	25	22	14
	Clown	0	1	0	4	1	4	1	2
	Elf-like	0	2	3	0	3	5	0	2
	Witch	8	3	5	13	3	0	12	2
	TOTAL	29	13	14	32	16	30	26	15
D4	Human (Head)	11	15	26	1	7	6	4	8
	TOTAL	13	16	27	2	9	7	4	9
D5	Household	0	1	0	11	2	2	2	0
	Candle	0	1	0	7	0	2	2	0
	TOTAL	5	5	2	23	3	2	9	1
D6	Animal (2 or more)	1	1	0	6	3	0	3	0
	Clouds	3	2	1	4	3	5	4	3
	Human (D4 elaborated)	3	6	5	0	2	2	1	1
	TOTAL	17	15	8	20	12	8	13	7

TABLE XIII — *(Continued)*

Card IX (Continued)

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
D7	Animal (Antlers)	2	1	0	1	0	1	0	5
	TOTAL	5	1	1	3	0	8	6	9
Ds8	Clothing	0	1	0	1	0	0	6	1
	Household (Vase)	5	1	1	3	0	0	0	0
	Human	0	0	1	0	0	3	1	8
	Music (Violin)	0	2	5	0	0	0	0	0
	Nature (Ice, Water)	6	1	0	0	0	0	0	0
	TOTAL	20	9	10	7	3	6	18	15
D9	Botany (Tree)	1	3	0	9	0	0	3	0
	Household (Candlestick)	0	1	0	5	0	1	0	0
	TOTAL	3	5	3	16	0	1	6	0
D10	TOTAL	1	3	1	0	0	0	0	0
D11	TOTAL	2	0	2	0	0	1	1	0
D12	Human (D3 elaborated)	2	0	5	1	3	2	1	2
	TOTAL	2	2	6	1	3	3	5	2
Dds22	TOTAL	5	2	3	0	1	2	2	0
Dds23	TOTAL	0	1	1	0	1	0	1	5
Dd25	TOTAL	2	5	3	4	3	1	3	6
W minus D6	TOTAL	1	7	7	0	5	1	7	2
Upper ⅓ of W	TOTAL	3	5	3	1	1	4	1	1
Dds lateral to Dd21	Animal (Rodent)	0	0	0	0	0	1	6	1
	TOTAL	1	0	2	1	0	4	6	4
Dds below Dd26	TOTAL	2	1	0	1	1	5	4	5
Dd at top of D3	TOTAL	1	0	4	4	2	3	3	5
	TOTAL R	203	181	167	198	137	152	171	157

Card X

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
W	Animal	7	5	7	10	11	6	12	5
	Animals (Group of)	5	1	4	6	1	6	5	3
	Butterfly	0	1	1	1	0	0	5	0
	Insects	2	3	2	3	7	0	0	0
	Art	8	9	2	8	2	3	1	5
	Botany	4	5	1	1	7	1	0	2
	Geography (Map)	0	2	4	2	1	4	8	12
	TOTAL	32	30	26	28	27	24	25	35
D1	Animal	33	32	29	39	34	26	14	15
	Crab	8	4	13	4	9	11	2	8
	Sea (Various types)	8	4	3	7	3	3	5	6
	Spider	15	24	13	25	16	7	2	0
	Geography (Lakes)	0	0	0	1	0	0	6	3
	Ink	5	6	3	2	0	3	2	1
	TOTAL	41	42	40	48	38	38	26	23
D2	Animal	18	20	16	28	26	29	19	11
	Dog	13	16	8	24	25	27	17	10
	TOTAL	21	25	20	29	27	30	21	13
D3	Animal (Wishbone)	8	9	12	9	2	7	21	17
	Botany (Seed-like)	8	6	2	2	2	0	0	0
	TOTAL	20	22	14	17	5	9	26	20

Card X (Continued)

Beck Area	Content	C (PC)	C (S)	A	CS	S	W	CF	F
D4	Animal	28	26	9	18	8	13	19	14
	Caterpillar or worm	19	21	3	5	1	2	1	0
	V Head (Turkey)	1	0	0	6	3	5	4	2
	V Sea Horse	5	4	3	1	3	4	12	11
	Human (Chaps, Legs)	0	1	0	2	2	8	10	11
	TOTAL	29	30	9	22	11	21	33	26
D5	Animal	23	25	7	2	0	1	3	0
	Head (Rabbit)	19	24	7	2	0	1	2	0
	TOTAL	25	25	7	2	0	1	3	0
D6	Animal	5	7	6	1	3	1	1	1
	TOTAL	7	11	8	5	4	2	2	3
D7	Animal	22	15	10	10	4	11	5	7
	Crawfish	5	2	5	2	1	3	0	1
	Deer	8	6	3	2	0	6	3	2
	TOTAL	24	16	11	10	4	11	5	7
D8	Animal	24	14	11	35	6	1	58	0
	Insects	9	10	3	3	2	0	0	0
	Rabbits	0	0	0	0	0	0	10	0
	Rats, Mice	1	0	0	8	0	0	6	0
	Sea	4	1	5	3	2	0	1	0
	TOTAL	26	16	12	37	7	1	60	0
D9	Animal	4	5	3	3	4	0	0	0
	Geography	2	1	1	5	0	5	7	1
	Human	10	7	3	26	3	11	4	7
	∧V Persons, 2 ∧ Person, 1 (with D8 as head)	10	7	0	15	3	7	2	2
	TOTAL	24	19	16	36	12	19	13	8
D10	Animal	3	5	5	3	5	3	3	1
	TOTAL	5	5	8	8	10	4	8	13
D11	Anatomy	5	2	1	0	1	2	0	0
	Animals, 2 (By D14)	10	4	1	10	1	0	10	0
	TOTAL	19	11	2	10	5	5	11	10
D12	Animal	8	8	10	14	6	7	16	8
	Cow	0	1	2	5	5	2	1	1
	Sheep	1	2	1	0	0	1	5	2
	TOTAL	9	8	11	15	6	8	17	8
D13	Animal	10	8	7	2	2	5	3	3
	> Dog	5	2	4	1	1	0	2	1
	Geography (Map)	1	0	2	1	0	2	7	5
	TOTAL	22	16	16	8	6	9	11	10
D14	Botany (Tree Trunk)	4	6	1	2	13	9	0	12
	TOTAL	6	9	2	7	16	15	4	19
D15	Botany (Flower)	7	2	0	0	0	0	0	0
	TOTAL	10	4	5	3	6	4	2	1
Dds29	Animal (Turtle)	0	0	0	0	0	0	2	9
	Human	0	0	0	2	3	13	2	2
	TOTAL	0	0	0	3	7	15	6	14
D7 + D15 Dds in D5	Animal	1	1	0	1	2	2	2	5
	Recreation (Horseshoes)	0	0	0	0	1	1	8	8
	TOTAL	0	0	0	1	1	1	13	13
D1 projections	Animal	1	1	3	0	4	3	5	1
	TOTAL	2	2	3	2	6	4	6	8
	TOTAL R	346	318	233	318	222	243	320	272

card involved. Many chi-square analyses were done on the data in this table, but space does not permit their inclusion. In the discussion that follows reference to the C group or the C blot is intended to mean that data from $C_{(PC)}$ and $C_{(8)}$ have been combined and are being treated as a single group.

Card I

W

1. Anatomical responses were infrequent unless the blot was shaded (C, A).

2. Shading increased the number of animal responses. Bats were most frequent when the stimulus was shaded, least frequent when the figure was white. Butterfly was less frequent for each series than the bat. Animal rug or skin was relatively frequent on the CF blot, despite the absence of shading.

3. The line figures (CF, F) had a tremendous pull for the map response. (This vague, undifferentiated response often seemed to reflect the poverty in associations that overcame *Ss* as they looked at these stimuli.)

4. Human percepts, involving the whole blot, were most common when the figure was either a uniform grey or white on the contrasting background (i.e., S, W). Witches were also most frequent on S and W.

5. Shading was conducive to the ink response, but it also occurred on the other series although less frequently.

6. CF had a strong pull for the mask percept.

7. There were fewer whole responses when the figure was a solid grey or white (S, W).

D1

1. This area was not interpreted very often on any of the series. To denote it D1, as Beck does, is inconsistent with these data.

D2

1. It is very striking how often a human interpretation was given to D2 when shading was eliminated and the area was made into a solid grey or white (CS, S, W). Witches were most common on the S series, but they were also rather frequent on W and CS.

2. When this area was made a solid grey or white and at the same time contrasted with its background, *Ss* interpreted it more frequently (CS, S, W).

D3

1. The D3 form is present on CS and CF but *Ss* did not interpret the area as a separate response. The shading nuances thus appear to be quite important in determining the pull of this area on the standard card.

D4

1. The animal response, especially the silhouette of a cat, was frequent when shading was removed and the area was made into a uniform grey (S).

2. The D4 area was seldom interpreted unless the Dds 26 area contrasted in "color" with it.

D5

1. Again, as with D1, the frequency of response to this area was considerably less for each series than one would expect from Beck's designation of locations.

D6

1. The data indicate that this area was responded to more often when the shading was eliminated (CS, S).

D7

1. Responses were given most frequently on the line and silhouette figures (CF, F, S).

D8, D9

1. Structure did not affect frequency of interpretation.

Dd 23

1. These small dots were interpreted as islands with a remarkably high frequency on both W and CF. This would appear to be an excellent example of how the pulling power of a small area can be affected by total blot structure.

Dd 24

1. The shape of this area conforms closely to that of bell, but only *Ss* in group CS reported such a percept. If

one should get this response on the standard series it would suggest that *S* was somehow able to "rise above" the pulling power of the more commonly perceived D3 and D4 areas. Like "hidden figures" the form is there, but most *S*s do not see it unless the blot is altered to assist them.

Dd s 26

1. Islands or lakes (usually as part of a whole response) were most common on the line figure (F, CF).

Upper ½ of D4

1. Anatomical responses to this area were dependent upon shading, in most instances.

Total R

1. The total number of responses given to card I was little affected by blot structure, although the trend was toward more responses on CS and CF.

CARD II

W

1. Animal responses to the whole card were most frequent on the shaded (A) and complex form (CF) series. Bears and chickens (as two forms) tended to predominate on A while butterfly and crab (as single forms) were most common on CF.

2. As on card I, geographical responses were relatively frequent on the line series (CF, F).

3. The effect of structure upon response was graphically illustrated in the distribution of human percepts. About three-fourths of the *S*s in groups S and W saw two persons. Groups F and A were next high followed by groups CS and CF. Only 11 out of 162 *S*s gave such a response to the standard blot (C). The achievement of such a percept on the C blot would thus suggest an ability to overcome structure effects which block total integration for most *S*s.

4. Whole responses were much less frequent on the C blot, indicating color effects.

D1

1. Color sets D1 off as a distinct area, and led to enhanced pulling power on the C blot.

2. It is interesting also that on CS (where shading is absent) there were 20 responses of either dog or dog's head but no bear responses. When D1 was shaded (C, A) responses to this area were about equally divided between bears and dogs. The suggestion is that shading may be critical for the emergence of the bear response.

D2

1. Animal responses were most frequent on CF, but they varied widely in type. Bird heads were relatively common on A while winged animals were most common on C.

2. Blood responses occurred only on the colored blots, although reports in the literature (3) indicate that occasionally such responses are given to achromatic blots.

3. Human hand and foot responses were much more frequent on series CS.

4. Frequency of interpretation of this area was dependent upon its being separated sharply from the remainder of the blot. Color, a line, or contrast variation are different ways of doing this. Total R was about the same on C, CS, and CF but appreciably lower on the remaining series.

D3

1. The frequency of interpretation pattern was quite similar for that of D2 just reported.

2. Butterfly responses were as common on CS and CF as C, thus indicating the primacy of a form determinant.

3. Blood responses were given only on C.

4. Fire percepts, however, occurred on CF as well as C. The flame-like projections were probably important in this regard.

D4

1. The pull of this area was greatest on CS.

Ds5

1. There were many more responses to this area on the line and white figures (CF, F, W).

2. The lamp percept was infrequent

on C and A compared to the other series.

D6

1. This area was interpreted most frequently when D2 and D3 were colored.

D7

1. Responses to D7 were so rare that Beck's classification of this area as a major detail must be seriously questioned.

Dd 25

1. The icicle and stalagmite responses were most common when these projections were either shaded (A) or white (W, CF, F).

Dd s 29

1. Response frequency was elevated on W and F.

Dd s 30

1. This area, which was never interpreted on the standard card, evoked responses from about 12 per cent of the *S*s in group W.

D2 + D3

1. Formation of a percept involving these two widely separated areas was dependent upon their being colored.

Total R

1. Again productivity tended to be high on CS and CF. The achromatic blot elicited fewer responses, however, than did the colored blot. The silhouette form (S) was very difficult for most *S*s to give more than one response to. W was less difficult in this regard, primarily because of the greater ease with which figure-ground reversals took place. (W had 30 more space responses than S.)

Card III

W

1. Whole responses were infrequent on card III; color neither raised nor lowered their frequency.

2. Line figures again provoked more geographical responses.

D1 and D9

1. Fewer responses to this area occurred on the solid grey, solid white, and simple form series (S, W, F).

2. Bird responses were most common when the area was either shaded or solid white (C, A, W).

3. Dog percepts occurred on only the shaded and complex silhouette blots (C, A, CS).

4. The frequency of the human percept was elevated on CF.

D2

1. The tendency was for color to depress the number of responses to D2, probably because the color was oftentimes difficult to reconcile with the form suggested by the area.

2. There is a suggestion that color may have facilitated the stomach and anatomical responses in general, but the data are only suggestive in this regard.

3. Animal responses were not as frequent when the area was colored.

4. Blood percepts occurred only on C.

5. Botanical responses were more frequent when D2 was not colored.

D3

1. Fewer responses were given to this area when it was in white (F, W, CF).

2. Color tended to increase the number of anatomical percepts.

3. The butterfly response was given much more often when the area was a uniform grey (S); color did not facilitate this response.

4. The bow or tie percept occurred most frequently on CS; color did not play a significant role.

D4

1. This area was interpreted most frequently when it was not shaded (CS).

D5

1. Shading tended to facilitate the tree limb response.

D7

1. Responses were most frequent when this area was a solid white or grey (W, S).

2. Anatomical responses were not dependent upon shading.

D7 as part of D1

1. The interpretation of this area as fire was much more common on the

line figures (CF, F).

2. Pot-like responses were facilitated by the area being either a solid grey or a solid white (S, W).

Total R

1. As on the previous two cards, total R tended to be high on CS and CF. F, W, and S pulled the fewest responses.

CARD IV

W

1. Anatomical responses occurred most frequently when the card was shaded.

2. Ape-like animals were as common when the figure was white as when it was grey.

3. The bat was most common on the F blot.

4. Animal skin was considerably more frequent when the blot was shaded, but this response was found on each series.

5. Shading tended to reduce the frequency of the tree percept.

6. Most interesting was the fact that the human response was much less frequent on the shaded blot (C, A) than it was on the F, S, W, and CS blots. The shaded blot was high on animal responses whereas the non-shaded blots were relatively high on human responses.

D1

1. Animal responses (especially heads) were also comparatively common when this area was shaded (C, A).

D2

1. Series S and W had a high pull for shoes.

D3

1. The interpretation of this area as a flower was critically dependent upon shading. Other responses to the area were also infrequent without shading.

D4

1. On the line figures a number of *Ss* gave the response of bird head, making use of Dd s 31 as part of the head along with D4 proper.

2. The snake percept was most common on CS.

D5

1. This area is most clearly demarcated on CF and CS; the frequency of response to this area was correspondingly high on these two series.

2. The spine response, however, was given 15 times on the shaded blot (C, A) but only once on the remaining series.

3. About one-half of the responses on CF involved a tree trunk, an infrequent response on other series. A smaller number of *Ss* saw this area as a human arm or leg (only on CF).

D6

1. When the line dividing D2 and D7 was emphasized (i.e., on CS and CF) the boot response became infrequent.

D8

1. Animal responses (primarily dog heads) were least frequent on the shaded card; the reason for this is not clear.

Lower part of D1

1. On the standard card *Ss* frequently gave an animal head response to all of D1; on series F an animal head was seen with about equal frequency but *Ss* restricted it to the lower portion of D1.

W minus D1

1. As with the whole card, human responses tended to be more common when shading was removed.

Total R

1. CF pulled more responses than did the other cards, which were roughly comparable to each other.

CARD V

W

1. Whole responses were very common on all series and not markedly affected by blot structure.

2. The butterfly response occurred with a frequency equal to or greater than that for the bat on each series, a reversal of the relationship found on card I.

3. The bat was almost as common on the white figures (W, CF, F) as on the grey figures (C, A, CS, S).

4. Geographical percepts were again most frequent on F.

D1

1. CF evoked more animal legs than the other series whereas CS pulled the most human legs.

D2 and D8

1. There was a pronounced increase in the number of human leg percepts when shading was eliminated but the area retained its separateness (i.e., CS).

D3 and D9

1. These areas were interpreted somewhat more often on the line series (CF, F).

D4

1. Frequency of interpretation was not affected by structure, but animal interpretations were most common on the uniformly white figures (W, F).

D5

1. *Ss* did not define this as an interpretive area when the figure was white (W, CF, F).

D6

1. Structure had no clearly defined effects.

D7

1. Responses were most frequent on CS and W.

2. The rabbit percept was especially common when the figure was uniformly white (W, F).

3. There was a pronounced tendency to see this area as a human on CS.

D10

1. This area pulled more responses on the line series (CF, F) than on the remaining series.

Dd 30

1. This area was more sharply delimited on CS than on any other series and the resulting frequency of response was higher. It was always seen as a human head on CS.

Cut-off wholes

1. These were most common on CS, due primarily to the sharp gradient between D1 and the remainder of the blot.

Total R

1. CS and CF again evoked more responses than did the other blots.

Cards VI

W

1. The uniformly white blots (W, F) produced the greatest number of whole responses.

2. Uniformly white and uniformly grey blots (F, S, W) evoked a relatively high frequency of cat percepts. (W was also high on dog.)

3. Shading did not affect the frequency of skin responses.

4. Turtle percepts were limited almost completely to blots having some variation in shading (C, A, CS).

5. Human responses tended to be most common on the uniformly grey and white blots (S, W, F).

D1

1. When S responded to the entire blot shading did not affect the frequency of skin responses, but when *S* restricted himself to D1 shading did make an appreciable difference (C and A were higher).

2. Human percepts were pulled most frequently by the line figures (CF, F).

3. Shading increased the frequency of response to D1.

D2

1. This area was delimited most sharply on CS and CF, with consequent rise in frequency of interpretation. CF was especially prone to draw a human response.

D3

1. Cat heads were relatively frequent on uniformly white and grey blots (S, W, F), just as cat responses to the whole blot were comparatively frequent on these series (see above).

2. Frequency of total responses was not affected by blot structure, except on CS where it was lowered.

D4

1. The number of responses to this area was little affected by the presence or absence of a central dividing line.

D5

1. When this area was delimited sharply (CS, CF) the number of responses to it increased, candles and posts being most common.

D6

1. Separate interpretation of D6 was least common when this area was most continuous with the remainder of the blot (S, W).

D7

1. There was little variation due to structure.

D8

1. Again as for the whole blot and D3, cat responses were relatively common on S, W, and F. These series also pulled the largest total number of responses.

D9

1. Percepts were most frequent on CS, with dogs head being the preferred response for two-thirds of the *S*s.

D10

1. Response to this area was quite rare.

D11

1. This area was most sharply defined on CS, and responses were more numerous than on the other series.

D12

1. Blot construction unduly emphasized this area on CS and CF, with a resultant rise in the frequency of interpretation.

Dd 26

1. Many more responses to Dd 26 were given on the CS series; all but one involved some kind of animal whiskers.

Total R

1. Overall productivity was again high on CS and CF; fewest responses occurred on S.

CARD VII

W

1. Shading tended to increase whole responses, although they were even more numerous on the line drawings.

2. Animal percepts were relatively more frequent on the shaded cards, except for a comparably high frequency on CF.

3. Clothing (especially collar) responses were fairly common on the simple form series (F).

4. Thirty cloud percepts occurred when the blot was shaded, but only four such percepts were given to the other five series.

5. The line figures did not have a greater pull for geographical responses, as was true for some of the earlier cards.

6. Series F evoked a relatively high frequency of chair responses.

7. Human responses were most common on the white (W, F, CF) and uniformly grey (S) blots.

D1

1. Responses to CS were most numerous; most of these involved the human head.

2. The shaded cards (C, A) tended to have the greatest pull for animal responses.

D2

1. The shaded cards (C, A) and the line figures (CF, F) were relatively high on animal responses, dogs being most frequent.

2. CS, S, and W were high on human responses.

D4

1. The butterfly response did not occur unless this area was solid along with a clear specification of the body area of the butterfly (C, A, CS).

D5

1. Structure did not affect frequency of response.

D6

1. CF and CS delimited this area most sharply, and frequency of response was greatest on these blots.

Ds7

1. There was some tendency for more frequent figure-ground reversal on W, but this trend was not pronounced.

D8

1. Shading tended to increase the frequency of interpretation.

D10

1. Interpretation was limited to those series having a central dividing line (C, A, CS), with one exception.

D11

This area is most clearly defined as a form on CF and responses were more common on this series.

Total R

1. Once again CS stimulated the greatest productivity while responses were least numerous on S and W.

Card VIII

W

1. The number of whole anatomical responses was greater on the colored than on the achromatic card, although the remaining experimental cards were equal in pull with the C card.

2. D1 elaborations of the animal response were much more frequent on the achromatic card than on the colored card or other modifications.

3. *Ss* often give color as the basis for an art response on card VIII, but art responses were of about equal frequency on the several series.

4. The line figures (CF, F) again pulled more geographical responses than the other series.

5. Color and shading did not affect the total number of whole responses, but these were most numerous on CF and F.

D1

1. Almost all *Ss* in all groups reported an animal percept, except for a marked reduction on the line figures (CF, F).

2. The bear response was more frequent when the area was not colored, or not in white.

3. Color reduced the number of catlike responses.

4. The rat was most common when the area was shaded but without color (A).

5. There was a marked tendency for various types of rodents to be reported more frequently on the colored blot than on the other series.

6. The D1 area was attended to least frequently on the line figures (CF, F).

D2

1. Butterfly responses were much more common when this area was colored.

2. Flower responses were also highly dependent upon color.

3. Twenty *Ss* reported ice cream percepts; they were all on the C card.

4. When color was removed from this area but shading was retained, landscape responses became more numerous.

5. Total productivity on D2 was highly dependent upon color and shading.

D3

1. The large majority of responses on all series involved anatomical content, primarily some variation of ribs. The pull of this area for such responses was decidedly greater on W.

D4

1. The frequency of the tree percept was not related to structure.

2. The line figures (CF, F) evoked more mountain responses than did the other series; the total number of responses was also somewhat greater on these figures.

D5

1. Response totals were low on all series; they were not markedly affected by structure.

D6

1. The white blots (W, CF, F) pulled comparatively few responses to this area.

D7

1. This area was not interpreted unless its upper boundary was sharply delimited (C, A, CS, CF).

D8

1. The tree response was relatively frequent when this area was either white or a uniform grey (F, CF, S, W).

Dd24

1. This area was interpreted more often when color and shading were eliminated (CS, S, W, CF, F).

Dd26

1. Responses to this area were relatively frequent on CS; an animal head was the most common response.

Dds28

1. The line figures (CF, F) pulled a number of responses to this area.

Total R

1. Color did not affect productivity. Again CS was high on total responses while S and W were low.

CARD IX

W

1. Whole responses were more frequent on the colored card than on the achromatic or complex silhouette.
2. An animal face was relatively common on series F.
3. Art responses were most frequent on the standard series, suggesting an important role for color.
4. Explosions were also most common on C, but similar responses were given to most of the remaining series.
5. The line figures (CF, F) again led in geographical responses.
6. Human responses and mask responses were comparatively frequent on the white figures, and the solid grey figure (S, W, CF, F).
7. Shading was critical for the emergence of landscape percepts.

D1

1. When shading and color were eliminated responses to D1 became much more frequent; the content was predominantly human (CS).

D2

1. This area was defined on only C and A; its pull was much greater when colored than when achromatic.

D3

1. Human responses tended to increase when color and shading were eliminated (CS).
2. Witch percepts were reported on all series except W; the highest frequencies were on CS and CF.

D4

1. Color decreased the number of human heads whereas shading markedly increased their frequency (compare C, A, and CS).

D5

1. This area was delimited most sharply on CS and CF, with a resultant increase in frequency of response.

D6

1. The data indicate that shading was not necessary for the cloud percept to emerge.
2. D4 human elaborations were most common when the area was shaded (C, A).

D7

1. The white figures (W, CF, F) pulled the most responses to this area.

Ds8

1. Ice and water percepts occurred only on the colored card.

D9

1. CS produced the most responses, due primarily to the special emphasis placed on D5 on this card.

D10, D11, and D12

1. Responses to these areas were relatively infrequent.

Total R

1. Color tended to increase productivity on card IX, although CS was equally high. S and W again elicited the fewest responses.

CARD X

W

1. There were fewer whole responses to card X than to any other card. The structural properties being investigated had little affect upon this frequency, however.
2. Groups of insects were seen on every series except those in white (W, CF, F).
3. Color had some tendency to increase the number of art responses.
4. Geographical percepts were again relatively common on the line figures (CF, F).

D1

1. This area was not interpreted as frequently on the line figures (CF, F).
2. The white figures were seen least often as spiders (F, CF, W).
3. Although this area is blue on the

standard card, the response of lakes was most common on the line figures (CF, F).

4. Also, although the ink response was most frequent on C, it was also given on each of the remaining series except S.

D2

1. The dog percept was most common when this area was solid but not shaded (CS, S, W).

D3

1. Seed like percepts were relatively more frequent on the colored card whereas the wishbone was comparatively common on the line figures (CF, F).

D4

1. Color markedly facilitated the caterpillar or worm response.

2. The turkey head became more frequent when color and shading were eliminated (CS, S, W, CF, F).

3. There was a sharp rise in sea horse percepts on the line figures (CF, F).

4. The white figures (W, CF, F) pulled a large number of leg and chap responses.

D5

1. Color markedly increased the number of responses to this area; the content was usually rabbit head.

D6

1. Color and shading elevated productivity on D6 (C, A).

D7

1. Color tended to stimulate productivity on this area.

D8

1. There was a pronounced increase in frequency of interpretation on CF and CS; almost all of the responses were in the animal category. The accent on the eye in these two modifications appeared to be the responsible factor.

2. Insects, however, were much more common on the colored blot.

D9

1. Animal content did not occur on the white blots (W, CF, F).

2. Human percepts became much more common when color and shading were eliminated (CS).

D10

1. S and F pulled the most responses.

D11

1. The frequency of two animals next to D14 was directly related to the clarity of the eye in D8; C, CS, and CF were high.

D12

1. CF and CS pulled more responses than the other series.

D13

1. Shading increased productivity on D13 (C, A).

2. The dog was most frequently seen on C and A while a map was reported most often on the line figure (CF, F).

D14

1. There was considerable variability between the series, but the reasons for this are not apparent.

D15

1. The flower percept was critically dependent upon color.

Dds29

1. Interpretation of this area as a turtle was relatively frequent on F, whereas a human was more commonly perceived on W.

Dds in D5

1. This area "stood out" more on the line figures (CF, F); it was usually seen as a horseshoe.

Total R

1. Productivity was high on the colored card as well as on CF and CS. Series S and A evoked the fewest percepts.

Discussion

The data have been presented in detail so that the students and users of the Rorschach will be able to make use of the tables as basic references in their work. Remarks here will be limited to a few major points, since it is obvious that the data could be used to develop a separate paper discussing the gestalt properties of each

blot, much as Klein and Arnheim (12) have done from a more subjective viewpoint.

First, it is clear that properties of inkblots other than their form do affect the responses of *Ss*. Earlier and more limited studies (2, 3) had arrived at a somewhat different conclusion; in doing so they contradicted both clinical experience and common sense, if not perceptual theory. The small number of *Ss* in many studies, the limited number of dependent variables considered (especially the failure to treat content thoroughly), and the restriction of most studies to the color variable probably account for the early findings.

The effect of structure upon content scores appears to be fundamental, although the results summarized in Table II indicate that formal scores are also affected, even when productivity differences are controlled for. The differences in M, FM, A%, and P, however, can be traced to content since their scoring is directly linked to the content given by S. Two other scores, D and S, are not linked to content in this fashion and the data leave no doubt of their dependence upon structure. In addition individual card analyses make it clear that structure may affect formal scores on a particular card even though the analysis of total scores (i.e., over all ten cards) had failed to suggest such a relationship. For example, on card II the frequency of whole responses is intimately related to structure (see Table IV) whereas the total analysis (see Table II) had not indicated that structure affected the W score. The reader will of course recognize that a particular blot attribute, such as color, may increase the likelihood of a W response on one card while decreasing the likelihood on another card, thus laying the foundation for compensating differences.

Second, the data suggest that certain responses are critically dependent upon a given blot attribute and that one can make this statement independently of what S might or might not have said during an inquiry period. For example, on card VIII 20 *Ss* gave an ice cream response to the D2 area on the C card while no *S* gave such a response to any of the remaining series. It is fair to conclude that color is a primary and critical determinant of this response even though *S* might indicate color to be secondary to form, or possibly not mention color at all. Other examples can be gleaned from Table XIII, and have been briefly noted in the section on results.

Actually Table XIII can be used in a probability sense for estimating the most probable determinants of at least the more common responses. In a way Table XIII creates a Meehl-type cookbook (13) for scoring Rorschach determinants, although to be used successfully as such it would probably be necessary to base such a table on literally thousands of *Ss*. To give an example of how such a table might work, however, let us say that our *S* reports the perception of clouds on card VII and he indicates that the whole blot looks like this. Turning to clouds under W in Table XIII we find that 30 *Ss* gave such a response when the card was shaded, but only 4 *Ss* gave this response on the modifications. Without inquiring of *S* we can "bet" that he is responding to shading and score accordingly. Introspection is eliminated!

Careful examination of Table XIII, however, points up the fact that most responses are form determined rather than being dependent upon color and shading. Even with a very large population of *Ss* we should probably be able to find only a limited number of percepts whose frequency distributions would make us confident that color and/or shading were critical determinants.

Third, in a similar fashion Table XIII can be used to give us a probability estimate of how accurate *S* is in telling us the determinants of his response if we use an inquiry. For ex-

ample, if he tells us that D4 on card X looks like a worm because it is long and thin like a worm, the data in Table XIII would make us question whether or not he is aware of a probable significant determinant of his response other than form. Theoretically, by using a number of such distributions, one might be able to create an index which would scale individuals in terms of their awareness of the determinants of their perceptions. Such an index could have a number of interesting applications to the areas of personality and psychopathology.

Finally, it is evident that it is difficult to generalize regarding color and shading effects on the Rorschach although this has been done many times. Color may have facilitating or inhibitory effects for a given *S*, but one must also consider carefully the context of each individual card; similarly for shading and other blot properties. As an example, data in Table XIII is suggestive regarding shading as a stimulator of the anatomical response to the whole of card I, but on card II shading is not effective to the same degree. On card III (to D3) color does not facilitate the butterfly response, yet on card VIII (to D2) there is the definite indication that it does influence the emergence of this class of response. To evaluate properly the effects of such blot attributes one must consider carefully the other properties of the stimulus in question. It is hoped that the data presented will make such consideration a more realistic possibility for users of the Rorschach technique.

Summary

Six modifications of the Rorschach inkblots were constructed, each series differing from every other series in terms of stimulus structure. Blot properties such as color, shading, and figure-ground contrast were varied in a systematic manner but basic form was held constant.

Each of the six experimental series of blots was administered to separate groups of adult *Ss*. Two additional groups were given the standard Rorschach test, one with the regular inquiry and the other with a paired-comparison inquiry. There were 81 *Ss* in each of these 8 groups; the groups were not significantly different from one another with respect to the variables of age, sex, intelligence, and education.

The data were evaluated in order to determine the relationship between blot structure and behavior on the Rorschach. Formal scores as well as content scores were considered in detail, both for the test as a whole and for each individual card. Analysis indicated many effects due to structure, and makes it necessary to reconsider earlier more limited studies which questioned the reality of structural effects.

References

1. Allen, R. M. The influence of color in the Rorschach test on reaction time in a normal population. *J. proj. Tech.*, 1951, *15*, 481-485.

2. Baughman, E. E. A comparative analysis of Rorschach forms with altered stimulus characteristics. *J. proj. Tech.*, 1954, *18*, 151-164.

3. Baughman, E. E. The role of the stimulus in Rorschach responses. *Psychol. Bull.*, 1958, *55*, 121-147.

4. Baughman, E. E. A new method of Rorschach inquiry. *J. proj. Tech.*, 1959, *22*, 381-389.

5. Baughman, E. E. The effect of inquiry method on Rorschach color and shading scores. *J. proj. Tech.*, 1959, *23*, 3-7.

6. Beck, S. J. *Rorschach's Test. I. Basic processes.* (2nd ed.) New York: Grune & Stratton, 1949.

7. Beck, S. J., Rabin, A. I., Thiesen, W. G., Molish, H., & Thetford, W. N. The normal personality as projected in the Rorschach test. *J. Psychol.*, 1950, *30*, 241-298.

8. Belden, A. W., & Baughman, E. E. The effects of figure-ground contrast upon perception as evaluated by a modified Rorschach technique. *J. consult. Psychol.*, 1954, *18*, 29-34.

9. Cronbach, L. J. Statistical methods applied to Rorschach scores: a review. *Psychol. Bull.*, 1949, *46*, 393-429.

10. Fiske, D. W., & Baughman, E. E. Relationships between Rorschach scoring categories and the total number of responses. *J. abnorm. soc. Psychol.*, 1953, *48*, 25-32.

11. Holtzman, W. H. Objective scoring of

projective tests. Paper read at symposium on personality assessment, Louisiana State University, February, 1958.

12. Klein, A., & Arnheim, R. Perceptual analysis of a Rorschach card. *J. Pers.*, 1953, *22*, 60-70.

13. Meehl, P. E. Wanted — a good cookbook. *Amer. Psychologist.*, 1956, *11*, 263-272.

14. Sarason, S. B. *The clinical interaction.* New York: Harper, 1954.

15. Small, L. S. *Rorschach location and scoring manual.* New York: Grune & Stratton, 1956.

16. Waller, Patricia M. Correlates of Rorschach shading scores obtained with two methods of inquiry. Unpublished doctoral dissertation, Univer. of North Carolina, 1958.

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Rorschach Signs of "Organicity": A Physiological Basis For Perceptual Disturbances

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The psychological evaluation of persons with definite damage to the cerebral cortex is pursued for two reasons. On the one hand it is important to determine the degree to which disturbances in the nervous system affect adaptive behaviors. Unless this is done it is either difficult or impossible to devise appropriate life situations and/or training techniques. On the other hand, the examination of patients with known cerebral damage through the use of psychological tests lavs the basis for finding signs in psychological functioning that will permit one to determine the existence of central nervous system damage in patients who as yet have not been so diagnosed. Further, such an investigation helps to lay a basis for a better understanding of cerebral functioning in general (3, 12).

The attempt to find definitive psychological sequelae of cerebral damage has given rise to a whole series of reports (2, 10, 11, 12, 14, 16, 17, 24, 36, 27) concerning behavioral indicators which can, with greater or lesser success, predict the existence of cerebral dysfunction. Perceptual indicators have been among the most popular items utilized to this end, and the Rorschach test has occupied a prominent position in the array of instruments used. However, as a number of investigations indicate, many individuals, who, on independent study, are known to have cerebral lesions, do not show the kinds of perceptual peculiarity on psychological testing that have been utilized as indicators of "organicity". Any and all psychological signs that have been used produce equivocal results, and do not provide an adequate basis for differential diagnosis. This situation has been particularly true when the Rorschach test has been used as the instrument for diagnosing cerebral damage.

In 1937 Piotrowski reviewed the Rorschach literature and proposed on empirical grounds his now famous list of signs for the detection of intracranial pathology (34). The chief value of the sign list lay in the fact that it directed the examiner's attention in a systematic way to an aggregate of response dimensions that could be altered by cerebral damage. The signs Piotrowski suggested included low response total, small number of movement responses, long reaction time, low percentage of popular responses, low positive form percent, color naming, impotence, perplexity, repetitiveness or perseveration, and automatic phrasing. While some of these signs are not unique to the inkblot situation and can also be elicited in other test situations (e.g. in the Goldstein-Scheerer Test) the Rorschach test nevertheless, offers a familiar and systematic tool for clinical use. This is attested to by the overwhelming popularity of this instrument in clinical circles as well as by the amount of research energy that has been mobilized around the problem of predicting cerebral damage by means of Rorschach testing. Table I summarizes some of the more important researches on this question from 1937 to the present time. The popularity of the Rorschach test invites intensive consideration of the evidence for the validity as an indicator of cerebral damage.

It should be pointed out that, although the Rorschach test has been a widely accepted instrument, critics who are otherwise friendly to the test have expressed skepticism as to its

TABLE I—Summary of Rorschach Studies Using Piotrowski Signs

TABLE I—Summary of Rorschach Studies Using Piotrowski Signs On Brain Damaged Population

Author	*Brain Damaged*	*Controls*	*Results*	*Conclusion*
1. Piotrowski (34)	18 types, not specified	10 non-cerebral CNS 5 conversion hysteria	1. Presence of 5 of signs R, RT, M, C_n, F+%, P, Ppt, Imp, Pip, AP. Distinguishes B.D. 2. B.D. avge. 6.2 signs controls 1.5 signs	Signs valid
2. Nadel (32)	15 frontal lobe B.D.	15 non-frontal B.D.	1. Frontal lobe avge. 5.1 signs Non-frontal lobe avge. 1.6 signs	Signs valid for only frontal lobes.
3. Harrower-Errickson (14, 15)	10 pre-op-18 post-tumor cases of all kinds in all areas of brain		1. Pervasive constriction and restriction of personality on Rorschach. 2. Piotrowski's signs. "In general the results from my method and P's were in agreement, but there were cases in my pre-op group in which only 2 or 3 signs occurred". p. 887	Signs valid, not always accurate.
4. Hunt, T. H. (21)	40 pre-post lobotomy-schizophrenics		Changes on test minimal. Only 1 patient gave 6 signs.	Signs not valid.
5. Kisker, G. W. (23)	30 pre-post lobotomy-schizophrenics		Five signs are common, but no data is offered. Several Piotrowski signs occur in pre as well as post-op records. Therefore, must be function of pre-morbid personality.	Signs—limited validity.
6. Brussel, J. A. Grassi, I. Melniker, A. A. (6)	5 post concussion	11 varied psychiatric	Complete agreement in blind diagnosis with psychiatric judgment. Piotrowski signs used, but no data given.	Signs valid.
7. Aita, J., Reitan, R., Ruth, J. M. (1)	60 varied post was trauma	100 non-cerebral cases. Neurologic wards.	Imp, Pplx, Rpt, Ap and Cn are useful indices. The others except for F+% are useful in several cases. Nine additional signs are proposed.	Signs valid but need supplementation.

Note—Individual case studies are not included.

TABLE I — *(continued)*

Author	*Brain Damaged*	*Controls*	*Results*	*Conclusion*
8. Hughes, R. (20)	50 varied brain damaged	68 schizophrenics 74 neurotics 22 nurses	Piotrowski signs detect 20% of organics without falsely identifying a non-organic. Weighted signs based on factor analysis - more effective.	Signs—limited validity, need supplementation.
9 Kral, V. & Dörken, H. (26)	52 dementia paralytica		Piotrowski signs detect— a) 27% — G.P.I. (N. + 26) b) 57% — senile dementia (N = 30) c) 50% — localized cortical lesions (N = 10) Kral & Dörken scale based on absence of 7 common Rorschach categories are more effective.	Signs limited validity, need supplementation.
10. Kral, V. & Dörken, H. (28)	9 cases - lesions in diencephalon	6 cortical cases 5 basal ganglia 6 extrapyramidal	1. Diencephalon cases avge. 5.7 signs; 8 of 9 cases gave more than 5 signs. 2. No data on other groups	Signs—valid, need supplementation.
11. Kral, V. & Dörken, H. (27)	10 hyperkinetic with cortical involvement	10 akinetic - pallidum - substantia nigra system	1. Hyperkinetic avge. 5.1 signs Akinetic avge. 2.3 signs 2. Hyperkinetic similar to cortical	Signs valid—need supplementation.
12. Dörken, H. & Kral, V. (10)	a) 10 cortical extrapyamidal b) 10 hyperkinetic c) 10 diencephalon d) 10 extrapyramidal akinetic e) 10 diffuse organic f) 10 senile dementia g) 20 schizophrenia h) 10 manic depressive i) 10 neurotics j) 10 normals - superior I.Q. k) 10 normals - avge. I.Q.		1. Number of cases — 5 a) 50 b) 60 c) 80 d) 10 e) 50 f) 50 g) 50 h) 20 i) — j) — k) — 2. K & D signs more effective	Signs—limited validity, need supplementation.

Author	*Brain Damaged*	*Controls*	*Results*	*Conclusion*
13. Dörken, H. & Kral, V. (11)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
14. Dörken, H. & Kral, V. (12)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
15. Dörken, H. & Kral, V. (13)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
16. Dörken, H. & Kral, V. (14)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
17. Dörken, H. & Kral, V. (15)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
18. Dörken, H. & Kral, V. (16)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
19. Dörken, H. & Kral, V. (17)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
20. Dörken, H. & Kral, V. (18)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.
21. Dörken, H. & Kral, V. (19)	10 cases - lesions in diencephalon	10 cases - lesions in cortex	1. Diencephalon cases avge. 5.7 signs; cortical cases avge. 2.3 signs 2. Diencephalon cases similar to cortical	Signs valid—need supplementation.

Author	*Brain Damaged*	*Controls*	*Results*	*Conclusion*
13. Hertz, M. & Loehrke, L. (18)	50 post traumatic, V.A. cases	50 schizophrenics 50 anxiety	1. Scorer agreement on signs—very high 2. 5 or more signs in 26% organics, 8% neurotics, 0 normals. 3. Absence of signs does not contraindicate organicity. Signs present in "only small percent of cases".	Signs—limited validity.
14. Fisher, J. Gonda, T. & Little, K. (11)	84 B.D. random admissions to Neurology	34 non-B.D. admitted to Neurology.	1. Piotrowski signs pick up B.D. (32 of 34 cases) but miss many B.D. Does not misidentify non-B.D. 2. Piotrowski signs show no shrinkage in correlation whereas all other proposed signs do.	Signs—limited validity.
15. Reitan, R. M. (39, 41)	18 aphasics 18 non-aphasic B.D.	18 varied psychiatric	Imp and Pplx (.01 level) When 5 Piotrowski signs are added to Aita's 9 B.D. differ from control (.001)	Signs—limited validity.
16. Reitan, R. M. (40)	28 B.D. - CVA, tumor, epilepsy	28 neurosis 28 brucellosis	(Same as 15)	Signs—limited validity.
17. Reitan, R. M. (38)	15 neurosis 15 myxedema		(Same as 15)	Signs—limited validity.
18. Reitan, R. M. (37)	13 B.D.	13 hypertensives 13 neurosis	(Same as 15)	Signs—limited validity.
19. Reitan, R. M.	13 B.D.	13 multiple sclerosis 8 neurosis 5 paraplegias	(Same as 15)	Signs—limited validity.
20. Reitan, R. M. (36)	50 B.D.	50 non-B.D.	1. Imp, Plpx (.001), Rpt (.01), F+% (.02), T/R (.05), signs = .001 2. Big overlap — for clinical diagnoses	Signs—valid but not accurate for clinical purposes.

utility as an instrument for detecting cerebral pathology. Thus Klebanoff, *et al* (24) in their comprehensive review of the psychological consequences of brain damage note that "the Rorschach has thus far offered little that is new towards the understanding of the personality of the brain damaged" and further, that "It is unfortunate that most studies . . . have utilized the Rorschach test". In another paper Hertz and Loehrke (18) state that, "it may be seen that studies utilizing the signs of Piotrowski for diagnosing cerebral defect show contradictory and inconclusive negative results". Inspection of Table I will help the reader to appreciate the basis for the expressed skepticism. It can be noted in this table that the sign list of Piotrowski has been utilized in the examination of almost all the major types of brain damage. The kinds of cases studied have included patients with intracranial tumors, cerebral vascular accidents, traumatic injuries, lobotomies, dementia paralytica, senile dementia, etc. Further, the loci of injury have involved almost all areas of the brain. The nature of the control groups, too, has varied from study to study. A clear view of the evidence is made difficult, or even impossible, by the fact that the various parameters of cerebral dysfunction have not been examined systematically. Despite these difficulties, some general conclusions may be drawn on the basis of the investigations summarized in Table I.

Three general criticisms have been leveled against the use of the Piotrowski signs in the detection of cerebral damage. The first complaint is that other signs or scoring systems are more discriminating and should be used in place of the Piotrowski method. However, the alternative methods that have been used successfully in one investigation have shown no distinctive advantage over the original Piotrowski list when they are applied in new situations. Secondly, many studies suggest that while the Piotrowski signs are accurate they are insufficiently sensitive for differential clinical diagnosis of cerebral damage. The third and by far the most important criticism asserts that the Piotrowski sign list is inadequate since it produces too many false negative diagnoses. That is to say, that many individuals who do have brain damage do not perform on the Rorschach test as "brain damaged individuals should".

It is possible that all of these criticisms and, in particular, the major criticism of too many false negative diagnoses are not so much the consequence of the inadequacy of the Piotrowski signs of brain damage as they are consequences of the naivete of the concept of "organicity" itself. The concept is not a neurophysiologic concept but a behavioral one. It involves the idea that certain patternings of behavior, and psychological functions exist which are the result of damage to the cerebral hemispheres. The fact of "organicity" cannot be denied. Further, it is clear that the behaviors described under the concept almost never occur in the absence of cerebral damage. However, there is no good reason for assuming that the converse of this proposition is true. Namely, that cerebral damage never occurs without the consequent production of "organicity" in behavior. Rather, the evidence suggests that organicity in behavior is the consequence of *some* kinds of cerebral damage and not the consequence of other kinds of cerebral damage. Therefore, one can conclude that when the Piotrowski signs are present under circumstances in which neither mental retardation nor severe cultural deprivation is suspected (45) cerebral damage is also present, but one cannot conclude that cerebral defect is absent when the Rorschach test does not exhibit signs of organicity.

It appears to the present writers that much of the confusion and conflict exhibited in the investigations summarized in Table I is the result of the idea that behavior can be correlated with anatomical change. This conception which has never been adequate

must be replaced by a conception of the relation of behavior to physiological characteristics of cerebral functioning (3, 17). It is possible that behavior can be related to physiological events far better than it can be linked to the "mere facts" of anatomy.

A variety of contemporary investigations supports this viewpoint. The studies of Penfield (33) on the surgical removal of scar tissue areas of the cerebrum in cases of epileptic seizures suggest that under given conditions a larger amount of anatomical destruction of cerebrum may have less effect on behavioral indices than does a smaller area of destruction, The recent use of hemispherectomy (35, 5, 30) too, implies that the removal of an entire hemisphere may have less disturbing behavioral sequelae than does a lesser anatomical loss. These practices suggest that the behavioral disturbances are not the consequences of the removal of tissue *per se* but are rather the result of the physiological disturbances which lesions of a given character may produce. Hebb (16, 17) in several reports has emphasized this point and suggested that behavioral research be directed toward studying the physiological correlates of behavior rather than the anatomic ones at the structural level. In animal investigation the work of Lashley and Wade (44) indicates that the behavioral lacks after frontal pole removal in primates are not subtractive losses but are rather the results of active interference in residual cerebral functioning which a given lesion can produce. Krech (29), too, has raised this question in a recent theoretical paper. Cooper (9) most recently has shown, in studies of the subcortex, that partial damage of basal ganglia has more dramatic consequences for disturbed motor functioning than does the total obliteration of a ganglion. The clinical work in epilepsy, too, suggests that both psychological and physical signs of cerebral damage can be elicited in the epileptic patient shortly before or immediately after a grand mal seizure, but not at other times. Recent Russian investigations, as reported by Ivanov-Smolensky (22), also depart from a consideration of the anatomy of damage and focus attention upon the physiological consequences of cerebral defects, particularly as they relate to modifications of normal patterns of cerebral excitation and inhibition. Recent work on expressive aphasia by Birch (3), Birch and Lee (4), and by Cherry et al (7) provides additional material in support of this conception. In the light of all of these reports, it appears necessary to reassess the usefulness of Rorschach indicators of cerebral damage from the point of view of psycho-physiology rather than from the point of view of psycho-anatomy.

It is possible to approach the psycho-physiological problem by advancing the hypothesis that anatomical damage to the brain can be divided into at least two main functional categories. The first and simplest functional category is subtraction. Thus, a brain lesion in the occipital area, with the subsequent destruction of the visual cortex, may produce a subtractive defect in behavior, wherein one of the senses of the individual has been removed as a consequence of tissue destruction. If the lesion produces no other active interference with cerebral functioning, the amount of loss of function would be proportional to the amount of tissue destroyed, and, while lacks in behavior would be manifested, no signs of "organicity" at the psychological level need be found. A second functional category may be suggested in which the degree of psychological disturbance may be entirely out of proportion to the amount of tissue destroyed. Thus, a lesion may well produce behavioral difficulties because its activity adds new physiological dimensions to cerebral functioning and so actively and additively produces behavioral disturbances. In Penfield's studies, a small lesion, if irritative and additive, produced far more behavioral disturbance than the larger

lesion which is surgically introduced to remove the irritative focus. This second category of lesion which has additive as well as subtractive consequences is probably the type of destruction that produces the so-called signs of "organicity".

Once such a hypothesis is advanced, it becomes possible to explore the validity of the Piotrowski signs from a new direction. It is suggested that the Piotrowski signs are valid indicators of disturbance in those individuals in whom cerebral damage involves active, additive physiological changes, and is not characteristic of the behavior of patients with lesions that are primarily subtractive in nature. On the basis of these considerations, it was possible to design the following investigation.

Method and Procedure

Patients: Twenty hemiplegic patients were selected at random from a large number of brain damaged persons undergoing treatment at a physical medicine and rehabilitation center. The sole criterion for the selection of each patient was the fact that his chart summary indicated that a detailed medical examination was in the record and that a complete protocol of a Rorschach examination was available. The patients ranged in age from 26 to 65 years with a mean age of 47.5 years. In the group of patients studied (16 M, 4 F), fifteen exhibited a left hemiplegia, four a right hemiplegia, and one showed no gross motor involvement. These patients are fairly typical of the brain damaged population to be found at a rehabilitation center.

On a random basis, the patients were divided into two groups of ten each: A) The Rorschach records of the first group were examined for the Piotrowski signs of "organicity". This analysis led to the separation of the group into two sub-groups of five patients each. The members of one of the sub-groups exhibited classical Rorschach signs of organicity, while the members of the remaining sub-group did not show such signs. B) The second group of ten patients was categorized on the basis of the medical record into two sub-groups. One of these sub-groups showed signs deemed to be indicative of active cerebral damage while the other failed to show such signs and, therefore, may be considered to be composed of individuals whose lesions are reflected primarily in passive or subtractive consequences. Five individuals, too, fell into each of these sub-categories.

Predictions were then made from the Rorschach record sub-groups as to the expectations for medical findings. In the group for which the medical findings served as the basis for dichotomization predictions were made to the Rorschach protocols from the medical evidence. This design involves the prediction of the type of medical record from a perceptual measure, and the prediction of perceptual organization from a medical record. It may, therefore, be considered as a double check experimental procedure which permits the cross validation of initial findings.

Rorschach Measures

The Rorschach signs of "organicity," developed by Piotrowski, were used. The signs include low response total, small number of human movement responses, long reaction time, low percentage of popular responses, low positive form percent, color naming, impotence, perplexity, perservation, and automatic phrasing.

Medical Measures of Additive Disturbance

Those medical indices which were a reflection of autonomic dysfunctioning, disturbances of consciousness, and integration of sensations, as well as neurological release phenomena of pathological nature, were used as indicators of an actively interfering physiological process. These indices were selected in the absence of a direct measure of neurophysiological disturbance. We, therefore, can only

TABLE II—A Comparison of Medical Signs of Consequences of "Additive" Lesions in Brain Damaged Patients Divided Into "Organic" and "Nonorganic" Groups on the Basis of Piotrowski's Signs (N = 10)

	Reflexes	Medication	Optic Exam	Blood Pressure	Lability	Disorientation	Convulsion	Field Defect	Total
Organic (N = 5)	4	5	2	2	3	2	2	1	21
Nonorganic (N = 5)	3	1	0	0	0	0	0	1	5

presume that disturbance in any of the areas selected *could* be due to the additive effects of pathological physiologic processes. However, it is likely that when disturbance in most of the areas cited occurred, it was *very probably* due to such pathological additions.

Explicity, we used the following indicators as reflections of possible additive defect:

1) Sensory disturbance (ocular examination, field defect, hemisensory syndrome)
2) Disturbance in reflexes (Babinski, Hoffman, spasticity, clonus)
3) Convulsive phenomena,
4) Autonomic disturbance (blood pressure, lability),
5) Disturbance in consciousness (disorientation and mental confusion), and
6) A composite measure of disturbed functioning based on the nature of the medication administered (e.g. use of barbiturates, sedatives, and/or anti-convulsants), was deemed to be a measure of the physician's clinical judgment which was related to the dimension we have postulated.

We, therefore, searched the medical charts in the areas indicated and, if a combination of these measures was uncovered, the patient was classified as exhibiting signs of a lesion having active additive consequences.

The following are the specific medical findings that were utilized:

1) Presence of convulsions
2) High blood pressure
3) Spasticity
4) Positive Babinski
5) Hoffman
6) Clonus
7) Nature of medication prescribed, i.e., necessity for the use of barbiturates, sedatives and/or anti-convulsants
8) Examination of ocular apparatus, e.g., eye ground, pupillary reflexes, accomodation, etc.
9) Emotional lability during neurologic examination
10) Mental confusion and disorientation during neurologic examination.[1]

RESULTS

As may be seen in Table II, when the first group of ten patients was divided into two sub-groups of five each, on the basis of whether they exhibited five or more of Piotrowski's signs on the Rorschach test, clear-cut differences emerged in the medical findings. The Rorschach "organic" group showed an average of 4.2 medical signs, while the Rorschach non-"organic" group showed an average of 1.0 signs per patient. The lack of overlap between the groups may be seen by the fact that four of the five patients in the Rorschach "organic" group had four or more medical signs, while the

[1] Obviously, the measures which were utilized represent a combination of objective events and of subjective clinical impression entered by the examining physician. Moreover, the measures themselves are relatively gross and refer to several levels of disturbance of function. However, despite these crudities, their analysis provided a substantial starting point for investigation.

TABLE III—The Presence of Rorschach Signs of Organicity in Brain Damaged Patients Divided Into Two Groups on the Basis of the Presence of Additive or Subtractive Lesions (N = 10)

	R	RT	M	CN	Pers.	Imp.	Prplx.	AP	P%	F—%	Total
Additive Lesion (N = 5)	4	0	3	1	4	4	5	1	4	4	30
Subtractive Lesion (N = 5)	3	0	3	0	2	2	0	0	0	0	10

maximum number of medical signs in the Rorschach non-"organic" group was two. The rank order correlation between the number of Piotrowski signs and the number of medical signs of "additive" lesion was .92. Thus, the direction of the medical findings in nine of the ten cases was clearly predictable from the Rorschach results. The data support the view that patients who produce "organic" Rorschach records show medical pictures which are different from those which are found in patients who do not have "organic" Rorschach records.

An analysis of Table III indicates that when the second group of patients was divided into two sub-groups of five each on the basis of whether they exhibited medical evidence of "additive" neurological defect, the group which exhibited evidence of "additive" defects had an average of 6.0 Piotrowski signs on the Rorschach, while the group which exhibited "subtractive" or "passive" defects showed an average of only 2.0 Piotrowski signs. Thus, we find that brain damaged patients who are differentiated into "additive" or "passive" subgroups on the basis of medical findings produce characteristically different patterns of Rorschach responses. Only one patient of the ten under consideration does not fit the original hypothesis. The rank order correlation obtained between the number of medical signs of "additive" defect and the number of Piotrowski signs of Rorschach "organicity" was .75.

Our results tend to substantiate the view that "organicity" on the Rorschach test is related to sequelae of an "active" neuro-physiologic disturbance. The potency of the relationship may be seen by the fact that when all twenty patients under investigation were combined and treated as a unit, it was found that 18 of the 20 fit our hypothesis. The rank order correlation between the number of Piotrowski signs and the number of medical signs of "additive" disturbance was .77. The probability that this result occurs as a consequence of sampling error is less than .01.

DISCUSSION OF RESULTS

A more intensive analysis of the data is productive of several points of interest. The Rorschach signs which Piotrowski utilized may be divided into two meaningful categories. The first pertains to traditional Rorschach dimensions and the second to clinical features of behavior which can be observed in response to any demanding task and are not unique to the Rorschach test itself. In the first group belong the low response total, absence of human movement, reaction time, color naming, low percent popular and low form-plus percent. Of this group, only the low popular percent and the low percent of good form responses are useful in distinguishing between our groups of patients. It is of importance to appreciate that alteration in these two scores reflects deviance in performance. The ineffectiveness of the remaining formal Rorschach measures as discriminators may be the consequence of the fact that alteration in these scores is a reflection of subtractive loss rather than a manifestation of deviation or distortion in performance. Furthermore, the low response total and the paucity of human movement responses which are the principle regions of overlap between our groups

are precisely those measures which are particularly affected by depressed states. Therefore, abnormalities in these values may well reflect an individual's depressed mood in reaction to his illness rather than a primary disorder of neural integration.

The Rorschach indicators which are most effective in predicting the characteristics of medical status are those which the Rorschach test shares with other clinical devices. It is of interest to note that Rorschach records of ninety percent (90%) of the patient's exhibiting "organicity" show impotence, while one hundred percent show perplexity. On the contrary, zero percent (0%) of the non-"organic" groups show either of these signs. Perseveration is present in ninety percent of the "organic" patients and in fifty percent of the non-"organic" patients, and is obviously a more contaminated measure than is either impotence or perplexity. Automatic phrasing is present in forty percent of the "organic" patients and in zero percent of the non-"organic" group.

A study of Tables IV and V reveals which of the medical signs are most effective in distinguishing an "organic" from non-"organic" brain damaged patient. The primary medical findings which functioned to differentiate the groups are: (1) lability, (2) disorientation, and (3) convulsion. Medication appears in almost all instances to be administered in accordance with these characteristics and so serves as a composite measure which reflects the physician's attempt to modify these disturbing manifestations. It is probable that these findings refer essentially to disturbances in cortical-cortical and cortical-subcortical interrelations. Measures such as disordered reflexes and modified signs of sensory function are found with almost equal frequency in both groups of patients and are relatively useless as predictors of "organicity". Such measures as the results of optical examination and sphygmomanometry are suggestive in character, but provided no firm basis for differentiating Rorschach "organic" from Rorschach non-"organic" groups.

Our findings shed light on the Rorschach test as an instrument for the study of persons who are thought to be brain damaged. The test does not appear to be sensitive to brain damage *per se*, but it does reveal "organicity", one of the behavioral consequences of brain damage. We would prefer to think of "organicity" primarily as an impairment in organization of perceptions. The dimensions of this impairment have as yet not been well charted, however, the difficulty in attaining complex perceptions and the perceptual insecurities which are manifested by Piotrowski's signs appear to be relevant. It is, therefore, not surprising that an instrument like the Rorschach test which is sensitive to perceptions should be sensitive to "organicity". Other tests which require an integration of complex stimuli into meaningful Gestalten should also be expected to be sensitive to "organicity". The practical implications of our findings are: the presence of organicity on the Rorschach test is associated with brain damage. The absence of organicity does not mean that the individual does not have brain damage.

The findings point to another implication for clinical practice. There has been a growing tendency in Rorschach literature to ascribe specific value to different cards so that the stimulus "pull" of Card IV, for example, is alleged to represent one's reactions to authority and Card VI one's reactions to sexual stimuli. Indeed, several investigators (19, 31), have made successful predictions based on this notion. A hidden premise in this approach is that the cards have universal symbolic meanings. This would imply that people whose responses are similar are responding to similar symbolic representations. Yet our data would indicate that such a premise must be questioned. We would suggest that the "organic" patients in our group perform poorly not because of

TABLE IV—The Number of Medical Signs of "Additive" Lesions in "Organic" and Non-"Organic" Brain Damaged Patients

	Blood Pressure	Reflexes	Medication	Optic Exam.	Lability	Disorientation	Convulsion	Field Defect	Hemi-Sensory	Total Signs
"Organic" Group (N = 10)	5.5*	13	15.5	6	7	4	3.5	5	2	61.5
Non-"Organic" Group (N = 10)	3.5	14.5	1	0	.5	0	0	2	0	21.5

Note—In contradistinction to Tables II and III, which represented a deductive analysis of data in accordance with our hypothesis, Tables IV and V are concerned with an inductive analysis of the medical signs utilized in our dichotomization. The object of the present retrospective analysis is to determine which of the medical measures are most adequate for differentiating "organic and non-"organic" groups in a general population of patients with brain damage.

Patients who appeared to have borderline abnormality in a given area were credited with a .5.

TABLE V—A Comparison of the Number of "Organic" and Non-"Organic" Patients Who Show Definite Evidence of Medical Signs of "Additive" Lesions.

	Blood Pressure	Reflexes	Medication	Optic Exam.	Lability	Disorientation	Convulsion	Field Defect	Hemi-Sensory	Total Signs
"Organic" Group (N = 10)	5	9	7	5	7	4	3	4	2	46
Non-"Organic" Group (N = 10)	0	6.5	1	0	0	0	0	2	0	9.5

Note—CF footnote on Table IV.

the symbolic meanings of the cards, but because they cannot perform the task of organizing an ambiguous stimulus field. Our conclusions in this regard receives some support from recent studies (8, 13, 46) which emphasize the fact that the response or even the same pattern of responses have different meanings for different people.

The results obtained in the present investigation strongly support the premises that served as initial motivators of the research. It is abundantly clear that "brain-damage" and "organicity" are terms which though overlapping are not identities and serve to designate interdependent events. "Brain-damage" refers to the fact of an anatomical destruction, whereas "organicity" represents one of the varieties of functional consequences which may attend such destruction. Our data support the growing belief that in a broad sense damages to the cerebrum may result in, at least, two readily distinguishable alterations in behavioral functioning. The first of these consequences can be called subtractive; the second may be termed "additive" or "reorganizational". An analogy may serve to clarify the distinction. If a hole is cut in a piece of leather the remainder retains its functional integrity and has simply decreased in total extent. However, if an equivalent area is removed from a soap-film the consequence is no longer the same. A total reorganization of the structuro-functional attributes of the system occurs. It was the recognition of these differences that led Von Monakow (43) to his concept of diaschisis and Goldstein (12) to his reorganizational views. In the nervous system when total reorganization does not take place, lesions may function as passive subtractors of tissue which lead to limited deficits or as active sources or foci of interference with the activities of the intact residuum. Such sources of active disturbance do not yield simple subtractive defects, but rather function to introduce more global or general eccentricities of behavioral organization. It appears from our analysis that it is the latter "active" consequence which is reflected as "organicity" on the Rorschach test. For purposes of emphasis the phenomena referred to have been dealt with in a categorical fashion. However, it is far more likely that a continuum of dysfunction exists, ranging from relatively pure subtractive disturbances to full-blown active reorganization of function.

A serious weakness in the present study is our lack of information concerning the explicit loci of the neurologic damages which were present in the population studied. It is clear that for the hypothesis advanced to be explicity tested it would be necessary to contrast the psychologic characteristic of groups of patients who were matched for locus and extent of injury but who differed in the physiclogic alterations which attended the damage. However, such data are not available to us and as a consequence all conclusions must be regarded as tentative and suggestive rather than as definitive. The results obtained, however, strongly suggest that more explicit investigations in which neural locus is better controlled, are both potentially productive and desirable.

SUMMARY

Ten hemiplegic patients were divided into two groups of five each on the basis of whether they exhibited Piotrowski's signs of organicity on the Rorschach test. On the basis of this dichotomy it was possible to predict features of the medical examination which are postulated to be consequences of "additive" neurophysiological disturbance including lability, disorientation, convulsion, etc. When a second group of ten hemiplegic patients was subdivided into two groups of five each on the basis of whether they showed evidence of "additive" or "subtractive" neurophysiological disturbance, it was possible to predict the presence of Piotrowski signs. The medical records and the Rorschach were in agreement in 18 of the 20

cases. The correlation between number of additive signs and Piotrowski signs was 77. Organicity can be considered to be a result of neurophysiologic rather than neuroanatomic disturbance. The contradictory results of psychologic testing can be explained on the basis of this hypothesis. Those Piotrowski signs which are not unique to the Rorschach test are most helpful.

References

1. Aita, J. A., Reitan, R. M. & Ruth J. Psychiatric reactions in the late recovery period following brain injury. *Amer. J. Psychiat.*, 1947, *103*, 770-780.

2. Baker, G. Diagnosis of organic brain damage in the adult. In B. Klopfer (Ed.), Vol. 2, *Development in the Rorschach technique*. Yonkers on Hudson, N.Y. World Book, 1956, p. 828.

3. Birch, H. G. Problems in differential diagnosis of mental retardation in evaluation and treatment of the mentally retarded child in clinics. N.Y., Nat'l Assn. for Retarded Children, 1956, p. 40-46.

4. Birch, H. G. & Lee J. Cortical inhibition in expressive aphasia. *A.M.A. Arch. Neurol. Psychiat.*, 1955, *74*, 514-517.

5. Bruell, J. H. & Albee, G. W. Higher intellectual functions in a patient with hemispherectomy. Paper read at Amer. Psychol. Assn., N.Y.C., Sept., 1957.

6. Brussel, J. A., Grassi, J. R. & Melniker, A. The Rorschach method and post concussion syndrome. *Psychiat. Quart.*, 1942, *16*, 707-743.

7. Cherry, C. *Nature*, Nov. 1955.

8. Cohen, J. The factorial structure of the W A I S between early adulthood and old age. *J. consult. Psychol.*, 1957, *21*, 283-290.

9. Cooper, I. S. Clinical results and follow-up studies in a personal series of 300 operations for Parkinsonism. *J. Amer. Geriat. Soc.*, 1956, *4*, 1167-1171.

10. Dörken, H. & Kral, V. The psychological differentiation of organic brain lesions and their localization by means of the Rorschach test. *Amer. J. Psychiat.*, 1952, *108*, 764-770.

11. Fisher, J., Gonda, T. A. & Little, K. B. The Rorschach and central nervous system pathology, a cross validation study. *Amer. J. Psychiat.*, 1956, *111*, 487-492.

12. Goldstein, J. *The Organism*. New York: Amer. Book, 1939.

13. Gruen, A. A critique and re-evaluation of Witkin's perception perception-personality work. *J. gen. Psychol.*, 1957, *56*, 73-95.

14. Harrower-Erickson, M. Personality changes accompanying cerebral lesions: I. Rorschach studies of patients with cerebral tumors. *A.M.A. Arch. Neurol. Psychiat.*, 1940, *43*, 859-890.

15. Harrower-Erickson, M. Personality changes accompanying cerebral lesions: II. Rorschach studies of patients with focal epilepsy. *A.M.A. Arch. Neurol. Psychol.*, 1940, *43*, 1081-1118.

16. Hebb, D. O. Man's frontal lobes; a critical review. *A.M.A. Arch. Neurol. Psychiat.*, 1945, *54*, 10-24.

17. Hebb, D. O. *The organization of behavior*. New York: J. Wiley, 1949.

18. Hertz, M. R. & Loehrke, L. The application of the Piotrowski and the Hughes signs of organic defect to a group of patients suffering from post-traumatic encephalopathy. *J. proj. Tech.*, 1954, *18*, 183-196.

19. Hirschstein R. & Rabin, A. I. Reactions to Rorschach cards IV and VII as a function of parental availability in childhood. *J. consult. Psychol.*, 1955, *19*, 473-475.

20. Hughes, R. M. A factor analysis of Rorschach diagnostic signs. *J. gen. Psychol.*, 1950, *43*, 85-103.

21. Hunt, T. The application of the Rorschach test and a word association test to patients undergoing prefrontal lobotomy. *Psychol. Bull.*, 1940, *37*, 546.

22. Ivanov-Smolensky, A. N. *Conditioned reflexes and the cerebral center*. Moscow: Medgiz, 1954.

23. Kisker, G. W. The Rorschach analysis of psychotics subjected to neuro-surgical interruption of the thalamo-cortical projections. *Psychiat. Q.*, 1944, *18*, 43-52.

24. Klebanoff, S. G., Singer, J. L. & Wilensky, H. Psychological consequences of brain lesions and ablations. *Psychol. Bull.* 1954, *51*, 1-41.

25. Koff, S. A. The Rorschach Test in differential diagnosis of cerebral concussion and psychoneurosis. *Bull. U. S. Army Med. Dept.*, 1946, *5*, 120-123.

26. Kral, V. A. & Dörken, H. Jr. Deterioration in dementia paralytica. *Amer. J. Psychiat.*, 1957, *109*, 614-692.

27. Kral, V. A. & Dörken, H. Jr. Comparative psychological study of hyperkinetic and akinetic extrapyramidal disorders. *A.M.A. Arch. Neurol. Psychiat.*, 1951, *66*, 431-442.

28. Kral, V. A. & Dörken, H. Jr. The influence of subarterial diencephalic brain lesions on emotionality as reflected in the Rorschach color responses. *Amer. J. Psychiat.*, 1951, *107*, 839-843.

29. Krech, D. Discussion: theory and reductionism. *Psychol. Rev.*, 1955, *62*, 229-232.

30. Krynauw, R. A. Infantile hemiplegia treated by removing one cerebral hemisphere. *J. Neurol., Neurosurg., Psychiat.*, 1950, *13*, 243.

31. Meer, B. & Singer, J. L. A note on the "Father" and "Mother" cards in the Rorschach inkblots. *J. consult. Psychol.*, 1950, *14*, 482-484.

32. Nadel, A. B. A qualitative analysis of behavior following cerebral lesions. *Arch. Psychol.*, 1938, *24*, 5-58.

33. Penfield, W. & Jasper, H. H. *Epilepsy and the functional anatomy of the human*

brain. Boston: Little, Brown, 1953.

34. Piotrowski, Z. The Rorschach inkblot method in organic disturbance of the central nervous system. *J. nerv. ment. Dis.*, 1937, *86*, 525-537.

35. Ranshoff, J. & Carter, S. Hemispherectomy in the treatment of convulsive seizures associated with infantile hemiplegia. In *Neurology and psychiatry in childhood*. Assn. Res. Nerv. Ment. Dis. *XXXIV* Baltimore: Williams Wilkins, 1954.

36. Reitan, R. M. Validity of Rorschach test as a measure of psychological effects of brain damage. *A.M.A. Arch. Neurol. Psychiat.*, 1955, *73*, 445-451.

37. Reitan, R. M. Intellectual and affective changes in essential hypertension. *Amer. J. Psychiat.*, 1954, *110*, 817-824.

38. Reitan, R. M. Intellectual functions in myxedema. *A.M.A. Arch. Neurol. Psychiat.*, 1953, *69*, 436-449.

39. Reitan, R. M. Intellectual functions in aphasic and non-aphasic brain injured subject. *Neurology*, 1953, *3*, 202-212.

40. Reitan, R. M. Intellectual and affective functions in chronic brucellosis. *Amer. J. Psychiat.*, 1953, *110*, 19-28.

41. Reitan, R. M. The performance of aphasic, non-aphasic and control subjects on the Rorschach test. *J. gen. Psychol.*, 1954, *51*, 199-212.

42. Rose, A. T. & Reitan, R. M. Intellectual and affective functions in multiple sclerosis. *A.M.A. Arch. Neurol. Psychiat.*, 1955, *73*, 663-677.

43. Van Monakow, C. *Gehirnpathologie*. Wien, (2nd Ed.) 1905.

44. Wade, Marjorie. Effect of sedatives upon delayed response in monkeys following removal of the prefrontal lobes. *J. Neurophysiol.*, 1947, *10*, 57-61.

45. Walton, B. On the validity of the Rorschach test in the diagnosis of intracranial pathology. *J. ment. Sci.*, 1955, *101*, 370-382.

46. Wittenborn, J. R. Level of mental health as a factor in the implications of Rorschach scores. *J. consult. Psychol.*, 1950, *14*, 469-472.

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The Bender Visual Motor Gestalt Test As an Index of Emotional Disturbance in Children

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The purpose of this study was to evaluate the clinical usefulness of the Bender Visual Motor Gestalt Test (BVMGT) as a projective technique for the personality appraisal of children. The BVMGT is frequently included in the standard battery of psychological tests administered to patients in hospitals and mental clinics. However, questions about the interpretive significance of the reproductions can receive only very limited and ill-defined answers from available literature about the test.

When the patient is an adult, the diagnostician may choose to score the deviations in order to obtain a summary score (4, 5, 12, 14); or he may apply interpretive hypotheses to the deviations either singly or in configurations. The scoring methods yield a gross diagnostic label which can be of use for research purposes, but which is of limited value in the clinic. Diagnosis for purposes of placement or treatment necessitates many things beyond the classification of "normal", "neurotic", or "psychotic".

A method of approach which involves interpretation of reproductions has more clinical usefulness providing, of course, that the interpretive hypotheses are valid. At present there is a single published paper about the diagnostic significance of BVMGT design deviations (9), and the hypotheses derived from this source are not accompanied by published experimental verification. Therefore the psychologist must base interpretations, for the most part, upon these unverified hypotheses or upon his educated guesses and his own accumulation of empirical evidence.

When the patient is a child or a defective adult, and the diagnostic question pertains to his maturation level, the psychologist can compare the figure reproductions with Lauretta Bender's original age scale (1, 2) and approximate the mental age of the individual. Evaluation of maturation is perhaps the best documented aspect of the test and the purpose for which it is most frequently used.

When, however, the diagnostic need is to understand childhood behavior problems, the clinician has no published source of interpretive hypotheses and only limited information about significant deviations. The only really comprehensive study of children's BVMGT productions is that of Byrd (6) who collected the records of 200 children ages 8 to 16 who had been diagnosed as needing psychotherapy. With these he compared the records of a similar age group of 200 children judged to be well-adjusted.

The variables which Byrd used for comparison of groups were 15 objectively defined test factors originally proposed by Hutt (9). Four of the variables differentiated the groups at all age levels, but the overlap was great; and the author cautioned against evaluation of a record on the basis of a sign approach alone. Byrd did not investigate the interpretation of differentiating variables.

This matter of diagnostic significance would appear to be the next step toward providing the child psychologist with a working body of knowledge about the BVMGT, and it is the purpose for which this study was designed.

HYPOTHESES

Following are the three general hypotheses and their detailed subparts tested in this study.

[1] This article is based on a doctoral dissertation completed at the University of Houston, Texas.

Hypothesis I. When measured quantitively, the kinds and amount of deviation from the stimulus figures will be significantly greater in the reproductions of clinic cases than in those of non-clinic cases. The deviations analyzed in connection with this hypothesis were used in adult studies by Hutt (9), Billingslea (5), or Peek and Quast (14).

The method for evaluating the amount of deviation for each variable was operationally defined as follows:

A. *Arrangement of figures.*

1. Order of figures: The arrangement or sequential order of the stimulus figures as reproduced:
   a. Rigid: All figures drawn so as to follow a direct sequence on the page in either a horizontal or vertical direction. Placement of the drawings appear forced and without consideration for size or shape.
   b. Orderly: A regular succession of figures in either horizontal or vertical sequence with the exception that one inversion (change in direction) was permitted.
   c. Irregular: More than one change in direction may be evident; but the changes are logical, e.g. to allow more space for a figure.
   d. Confused: No more than three figures are drawn in direct sequence, and the remainder are scattered about the page.
   e. Confused order with Figure A in the middle and the others placed arbitrarily around it.
2. Page cohesion or organization: The general location of the reproduced figures on the page or pages.
   a. Edge tendency: Two-thirds of the figures on any one page are arranged along either vertical edge in such manner that the figures do not extend beyond the midline if the paper is in vertical position, or beyond one-third the paper width in horizontal position.
   b. Top tendency: Two-thirds or more of the figures are contained within the upper one-third of the page when the paper is in vertical position, or contained within the upper one-half of the page when oriented horizontally.
   c. Bottom tendency: Two-thirds of the figures are contained within the bottom one-third of the page when the paper is in vertical position, or contained within the lower one-half of a page oriented horizontally.

B. *Modification in size:* The increase or decrease in linear size of the figures from that of the standard stimuli.

1. Reduction: Figures measured with graph paper (10 units to 1 inch). A record is classified in this category if five or more figures show a decrease of either the vertical or horizontal axis by more than one-quarter of the axis of the stimulus figure.
2. Expansion: Figures measured as for Reduction. A record is classified in this category if five or more figures show increase of either the vertical or horizontal axis by more than one-quarter of the axis of the stimulus figure.
3. Progressive increase in figure size, or at least one very large figure.

C. *Use of white space.*

1. Collision: Any figure or part of a figure is superimposed upon another reproduction.
2. Multiple pages: The use of more than one page for the reproductions.
3. Paper in horizontal position.

D. *Modification of gestalt.*

1. Rotation: The revolving of the total figure on its axis in either clockwise or counterclockwise direction such that the angle subtended between the figure's horizontal axis and the horizontal edge of the paper is more than 15° greater than that in the standard stimulus figures.
2. Left-right displacement (Fig. 5, 6, 8): The shifting of the point of connection of subparts of a figure one-fourth inch or more from the

position on the stimulus figures.

3. Regression or lack of maturation: The use of less mature concepts in figure reproductions. The following deviation must be present in three or more units of the figure to be so classified:
   a. The use of circles for dots or loops (Fig. 1, 2, 3, 5).
   b. The use of dashes or commas for dots or loops (Fig. 1, 2, 3, 5).
   c. The use of dots for loops (Fig. 2).
   d. The replacing of loops or dots by scribbles (Fig. 1, 2, 3, 5).
   e. The use of arcs instead of clear cut angles in the columns of Fig. 3.
4. Modification of curvature:
   a. Uneven amplitude of the horizontal sine wave of Fig. 6.
   b. Squaring (Fig. A, 4, 5, 6): A change in curvature so that the arc takes on a flattened rectangular form. In Fig. 6 this shape must be present in three or more units.
   c. Pointing (Fig. A, 4, 5, 6): A change in curvature so that the arc takes on a sharpened triangular form. In Fig. 6 this shape must be present in three or more units.
   d. Scalloping (Fig. 6): Three or more units extend in a single direction from the base line.
   e. Change in curvature (Fig. A, 4, 5, 6): An increase or decrease in curvature beyond established limits in two or more figures. The following ratios were established as limits (6).
      Figure A increased if perpendicular radii were less than 8:10.
      Figure 4, base-altitude ratios 1:1 to 3:1.
      Figure 5, base-altitude ratios 1:1 to 9:5.
      Figure 6, base-altitude ratios horizontal curve 2:1 to 5:1; vertical curve 1.5:1 to 6:1.
      Graph paper ruled 10 units to the inch was used to measure the figures.
5. Change in angulation (Fig. A, 2, 3, 4, 5, 6, 7, 8): A change of greater than 15 degrees in the size of the angle of a figure or the angle of intersection between subparts of a figure. This factor was scored when four or more figures contained increased or decreased angulation.
6. Closure (Fig. A, 4, 5, 6, 7, 8): The reproduction without overlap of the connected contour of the whole figure or of any subpart.
   a. Separation: White space showing between the subparts.
   b. Gap: A break in a contour which is continuous in the stimulus figure.
   c. Runover: Extension of a line beyond the point of juncture.
   d. Dog ears: An unsuccessful attempt to draw an angle by an extension beyond the linear joint.
7. Overlap of subparts:
   a. Penetration (Fig. A, 4, 5, 8): The reproduction of one subpart upon another subpart where these parts merely touch in the stimulus.
   b. Absorption (Fig. A, 4, 7, 8): Subparts touching, but the apex of one subpart lacking because of intersection with the other part.
8. Figure limits (Fig. 1, 2, 3, 5, 6): Deviation in the number of units.
   a. Perseveration: Two or more units in excess of the stimulus.
   b. Truncation: Two or more units less than that of the stimulus.

E. *Work methods:*

1. Sketching: Formation of a line by repetitive strokes resulting in a fuzzy quality.
2. Workover: Going over a previously made line or dot.
3. Heavy pressure: Two-thirds or more of the figures drawn with 70% or more color as measured by comparison with a standard engraving chart of half-tone screen values. Number two lead pencils were used.
4. Directionality of lines (Oblique subpart of Fig. 4, 5, 6): Notation was made of whether the oblique part was drawn in a generally outward or inward direction relative to the subject's body.

5. Erasure: Number of figure reproductions to which an eraser has been applied.

Hypothesis II. Deviations from the stimulus figures can be related to childhood disturbances. The first six sub-hypotheses were taken from Hutt (9) and were given some extrapolation to fit the developmental behavior of children.

A. The expansive style of organization (with figures spread widely over one or more pages) is indicative of an expansive or manic mood. In childhood this will be expressed in acting out behavior.

B. The compressive style of organization (with figures placed compactly within a segment of one page) indicates a sense of personal inadequacy, depression and constriction. In childhood this will be expressed behaviorally by withdrawal.

C. An overall increase in size of figures is a reaction formation to anxiety. It indicates overcompensation in expansiveness of mood. In childhood this will be expressed in acting out behavior.

D. A decrease in the size of figures is related to constriction, rigidity and a strict super ego; it indicates active overt anxiety and fearfulness. In childhood this will be expressed behaviorally by withdrawal.

E. Decreased amplitude of sine curves is correlated with suppression of affect, an emotional blunting. In childhood this will be expressed by withdrawal.

F. Exaggeration of curvature or increased amplitude is related to expansiveness of mood and manic behavior. In childhood this will be expressed by acting out behavior.

G. Difficulty in learning to read is related to a disturbance in the perceptual process whereby the general form is correctly perceived, but the parts within the whole are misperceived. It is hypothesized that in the clinic group there is a relationship between the reproduction of an incorrect number of units in Figures 1, 2, 3, 5, 6 on the BVMGT and the presence of reading problems.

Hypothesis III. In the clinic group the patterns of BVMGT deviations can be related to Rorschach determinants and contents. The relationships sought between BVMGT and Rorschach in this study are to be empirically determined, because there are no specific relationships reported in the literature.

A. Several configurations of Rorschach determinants can be discerned in the protocols of disturbed children (17). Each configuration is related to a pattern of BVMGT deviations.

B. Closure difficulty is manifested by incorrect reproduction at the point of closing the contour of a subpart or joining two subparts of a design. Such difficulty is an indication of fearfulness in interpersonal relationships (9), and is related to fearsome or aggressive human content in the Rorschach protocol.

C. Progressive increase or extreme unevenness in figure size is indicative of low frustration tolerance, irritability, and explosiveness (9). Such unevenness of size is related to the tendency to produce relatively more explosive, aggressive content to the chromatic than to the achromatic Rorschach cards.

SUBJECTS AND PROCEDURE

The experimental group consisted of 80 clients of the Wichita Guidance Center, Wichita, Kansas. The group included 40 boys and 40 girls in the age range 7-0 to 12-0 years, none of whom were psychotic, mentally defective or known to have brain lesions at the time of testing. These children had a wide and inclusive range of presenting symptoms, all of which can be de-

TABLE I—BVMGT Factors of Hypothesis I Scored Present - Absent

Factor	School N=80	Clinic N=80	Chi square	p
Organization				
•Orderly arrangement	36	10	19.07	.001
•Confused arrangement	9	24	7.48	.01
"A" in middle	6	21	8.73	.01
Irregular arrangement	16	17	—	—
Rigid arrangement	19	30	2.94	.10
Bottom tendency	2	8	—	—
Edge tendency	10	12	—	—
Top tendency	9	14	—	—
Summary of compressed arrangement	21	34	3.98	.05
Modification of size				
•Change in size	19	42	14.01	.001
Unevenness in size	5	28	18.48	.001
Modification of Gestalt				
•Rotation	14	42	21.54	.001
•Change in angulation	29	61	26.00	.001
•Change in curvature	5	18	7.31	.01
Squaring	64	59	—	—
Pointing	57	41	—	—
Scalloping	2	6	—	—
Separation	24	38	5.16	.05
Penetration	34	37	—	—
Displacement	65	65	—	—
Absorption	16	20	—	—
Perseveration	45	44	—	—
Truncation	56	48	—	—
Runover lines	75	80	—	—
Dog ears	4	4	—	—
Work methods				
Workover	73	56	7.31	.01
Sketching	2	3	—	—
Heavy pressure	48	57	2.24	.10
Paper horizontal	4	12	—	—
Multiple pages	9	22	5.77	.02
Directionality: 4 curve inward	60%	59%	—	—
Directionality: 5 spike inward	44%	70%	5.18	.05
Directionality: 6 vertical inward	80%	70%	—	—

•Previously cited as a significant differentiating factor (6).

scribed clinically as maladjustive behavior associated with emotional disturbances.

In the clinic group were 28 children described as "acting out", 41 children labeled "withdrawn" and 31 whose case histories noted reading problems among the presenting symptoms. The children were not examined for reading skills.

The control group was composed of 80 children within the specified age range attending the Wichita Public Schools and judged by teachers to be normally developing children typical of the age group. They were selected from eight schools which formed a stratified random sample of the city's socioeconomic levels. Five boys and five girls were chosen from each of the eight schools, and the selection of a boy and girl from each age range was made on the basis of proximity to the midpoint of the age range.

Each of the clinic subjects was given an individual measure of intelligence (Binet or WISC), Rorschach, and BVMGT. Each school subject was asked to draw a Goodenough figure as well as the BVMGT designs. The Goodenough figure drawings yielded mental age scores with which some degree of control could be exerted over variables related to intellectual functioning. The school and clinic subjects were matched in age, sex, I.Q.,

and socioeconomic status in groups rather than individually.

RESULTS AND DISCUSSION

Data pertaining to Hypothesis I are presented in Table I and Table II. Nine single and four summary factors out of 37 were found to yield chi square values significant at or beyond the .01 level. Seven of these factors had previously been shown by Byrd (6) to differentiate children needing therapy from well adjusted children. Verification of his findings supports the hypothesis that certain factors of the BVMGT are valid indices for evaluating personality adjustment.

Three sub hypotheses of Hypothesis II were confirmed at or beyond the .01 level, one was significant at the .05 level, and three were untestable because the N was too small. Table III gives specific data. Three comparisons in Hypothesis III yielded significance at the criterion level. They are presented in Table IV.

A total of 48 chi squares was calculated, 19 of which were significant at the .01 level. According to a suggested method for evaluating a series of statistical tests (15), the chance probability of obtaining this number of significant statistics is less than .001.

In the following paragraphs the results are discussed in each of four general groups of factors.

Organizational factors

Sequence. Five organizational factors were found to distinguish the

TABLE II—BVMGT Factors of Hypothesis I Differentiating School and Clinic Groups at or Beyond .01 Level of Confidence When Scored by Frequency of Appearance

Factor	Mdn. number of figures in which error appears	N above Mdn. School (N=80)	N above Mdn. Clinic (N=80)	Chi square	p
Regression	2	23	57	28.90	.001
*Closure	2	29	51	12.07	.001
Joining	3	28	52	14.40	.001
Erasure	3	49	31	8.10	.01

* Previously cited as a significant differentiating factor (6).

TABLE III—Comparison of Certain Behavioral Symptoms in the Clinic Cases With Respect to BVMGT Deviations

Behavior	BVMGT Factor	Chi square	p
Acting out	Expansive organization	15.00	<.001
Withdrawn	Compressed organization	6.12	<.05
Acting out	Increased figure size	—	—
Withdrawn	Decreased figure size	7.26	<.01
Acting out	Increased curvature	—	—
Withdrawn	Decreased curvature	—	—
Reading problems	Incorrect number of units	7.10	<.01
Acting out	Horizontal page Circular organization Uneven size	10.79	<.001

TABLE IV—Comparison of Rorschach Factors in Clinic Cases with Respect to BVMGT Deviations

Rorschach	BVMGT Factor	Chi square	p
Constricted	Constricted figure size	11.27	<.001
Interpersonal Aggression	Joining Trouble	8.06	<.01
Aggressive Responses	Uneven Figure Size	10.59	<.01

school and clinic groups. Two such factors pertained to the sequence of figures on the page. An orderly succession was typical of the records of well adjusted children, while the preponderance of chaotic succession was produced by the maladjusted. It seems reasonable to hypothesize that the disruptive factors involved in emotional disturbances result in unusual patterns of organization ranging from very compulsive, rigid arrangements to successions which are characterized by a jumbled, confused order.

Use of white space. Persons who spread figures widely on the page were described by Hutt as aggressive, rebellious individuals; and those who compress the figures into a small portion of the page were said to have withdrawn from a world which, to them, appeared menacing and hostile (9). In the present study both facets of the size variable showed significance with the respective behaviors, and Hutt's hypotheses were supported with this sample of children. It may be concluded, therefore, that an expansive arrangement of BVMGT figures has diagnostic significance as an indicator of a personality which expresses itself in acting out behavior, and compressed figures reflect a personality which tends to withdraw.

Change in Size

The factor of general change in size differentiated the groups significantly. The size change was principally that of decrease, and an hypothesized relationship between decreased figure size and withdrawn behavior found statistical support.

Small figure size was found to be associated with a pattern of Rorschach determinants which includes (1) $F\% > 50$; (2) no other single determinant $> 2\frac{1}{2}$; and (3) sum $C < 3$ (17). This configuration is a generally accepted indicator of an over controlled personality with inadequate channels of expression.

Among the clinic a peculiar type of BVMGT record was noted, in which figure size was uneven, either with progressive change in size or punctuated with one or more outsize figures. Hutt considered this to be good evidence of low frustration tolerance and behavioral symptoms such as irritability, explosiveness, and acting out. In the present study not all acting out children drew their figures in uneven sizes, but this pattern was one of three types of phenomena which were found in 75% of the records of acting out children. Exploring further the idea of low frustration tolerance and ease with which these children might respond, the investigator found relatively more explosive reaction to Rorschach color cards than to achromatic ones. In other words, responsiveness to stimulation from without was quantatively greater in those cases where BVMGT figures were markedly inconsistant in size.

It is believed that the relationships obtained in this clinic sample support the statement that figure size and control of affect are related in the case of disturbed children. Controlled or constricted affect accompanies constricted figure size, and uncontrolled affect is related to uneven figure size.

Changes in form

The third category of deviations includes those which in some way alter the pattern of the design.

Closure. Difficulty with joining the ends of contour lines was significantly more frequent in the clinic group, a finding consistent with those of Byrd and Hutt. Hutt believed that closure difficulty is related to fearfulness in interpersonal relationships.

Trauma in interpersonal relationships leads to emotional disturbance, which may be manifested behaviorally in different ways. It was hypothesized that if these interpersonal problems are still expressed in the main behavioral symptom pattern, such symptoms will be reflected, as Hutt described, in closure-joining difficulty on the BVMGT. Similarly, the interpersonal conflict would appear in Ror-

schach content as aggressive M. The two tests showed the predicted relationship; but the interpretive significance of aggressive M has not been established.

Regression. Although regression to simpler form was found in the majority of records in both groups, the clinic group showed significantly more such signs per record than did the school group. No satisfactory way was found to assess the diagnostic significance of this variable. A study of regressive signs is complicated by the fact that remnants of more primitive stages of perceptual motor development may continue into later stages. The so-called regressive signs in such instances are evidence of lag in maturation rather than reversion to earlier modes of behavior. It would appear that judgment of regression is warranted only if there is evidence of more mature forms in the BVMGT record.

Rotation. School and clinic children made about the same amount of severe rotation (90° to 180°); but when all figures with change of axis $\geqq 15°$ were counted as "rotated", the sign became a significant differentiating factor. It would appear that small rotations have greater diagnostic value, but no hypothesis was formulated.

Change in angulation. This factor successfully discriminated the clinic from the school group at a high level of significance as Byrd found. No interpretive hypothesis was formulated.

Change in curvature. Hutt considered the curved line figure to be an emotional stimulus for the perceiver; and he interpreted increased curvature as over response and decreased curvature as suppression of affect.

In the present study significantly more clinic children drew the curved line of figures out of proportion. It was noted that in each instance the deviation was in the direction of increased curvature, yet the number of such records was about equally divided between the acting out and withdrawn categories. The numbers were too small to treat statistically, but the findings, while supporting change in curvature as a sign of emotional disturbance did not differentiate the disturbance in the direction Hutt postulated.

Incorrect number of units. One type of distortion observed in the BVMGT productions of clinic cases with reading difficulties, involved a change in the number of units comprising the whole. Statistical support for a hypothesis of relatedness of incorrect number of units to reading difficulty comes from analysis of the data, but the diagnostic significance of such behavior is still speculative.

Pascal and Suttell gave very high negative scoring to incorrect number of units, thus indicating their judgment of the pathognomonic nature of the distortion in adult records. It is possible that this is one factor which involves perceptual learning and has different significance for different age groups.

Work Methods

Direction of drawing. Directionality was investigated in this study because it has been reported as diagnostically significant by Hutt and by Peek. With reference to unpublished findings, Hutt stated that the direction of drawing from the exterior toward the internal part of the design was associated with egocentric personalities (9). Peek substantiated this statement with a study of directionality of the "spike" in BVMGT Figure 5 as drawn by a sample of veterans (13).

In the present study direction of drawing the "spike" in Figure 5 was found to differentiate the clinic from the school group at the .05 level. Hence there is a tendency for drawing to be made outward by well adjusted children and inward by emotionally disturbed children.

Three factors were found more frequently on the school records than on the records of clinic children: Orderly succession; Erasure; and Workover. The first of these was discussed in an earlier paragraph.

Erasure. While 80% of children in the samples used an eraser at some point in their drawings, significantly more school records had erasures in excess of the median.

There are at least two alternative explanations for the frequent erasure of school children. One is the possibility that the sample of school children had well balanced personalities without emotional disturbance and therefore were able to express freely the childhood need to please adults and conform to requests. They took special care to correct deviations of which they were aware. The clinic cases were disturbed children who had perhaps given up trying to please anyone. They were frequently observed in the clinic making their drawings hastily, with some such remark as, "I can't draw good". Self concept and motivation seemed equally low.

Another possibility, and one somewhat akin to the first, is that the school children were less constricted and more spontaneous. Perhaps they felt freer to alter the situation.

Workover. These same possibilities may be equally reasonable when considering the factor of workover. Lines and dots were given additional attention more often by the school children.

Summary

The results of this study reveal the presence of meaningful diagnostic signs in children's BVMGT records beyond a simple ability to reproduce designs of differing complexity. Of the 13 variables which differentiated the two groups significantly, the data supported five hypotheses of interpretive significance and demonstrated three significant relationships between the BVMGT and the Rorschach. It is believed that Hutt's hypotheses about the significance of deviations with adults have been established, in part, with children.

References

1. Bender, Lauretta. A Visual-Motor Gestalt Test and its clinical use. *Res. Monogr.*, Amer. Orthopsychiat. Assn., No. 3, 1938.

2. Bender, Lauretta. Manual for instruction and test cards for Visual-Motor Gestalt Test. Amer. Orthopsychiat. Assn., 1946.

3. Bender, Lauretta. *Child psychiatric techniques.* Chicago: Thomas, 1952.

4. Billingslea, F. Y. The Bender-Gestalt: An objective scoring method and validating results. *Amer. Psychologist*, 1946, *1*, 286.

5. Billingslea, F. Y. The Bender Gestalt: An objective scoring method and validating data. *J. clin. Psychol.*, 1948, *4*, 1-27.

6. Byrd, E. The clinical validity of the Bender Gestalt Test with children: A developmental comparison of children in need of psycho-therapy and children judged well-adjusted. *J. proj. Tech.*, 1956, *20*, 127-136.

7. Goodenough, Florence. *The measuring of intelligence by drawings.* Yonkers: World Book, 1926.

8. Guilford, J. P. *Fundamental statistics in psychology and education.* New York: McGraw-Hill, 1950.

9. Hutt, M. L. Revised Bender Visual-Motor Gestalt Test. In A. Weider (Ed.), *Contributions toward medical psychology.* New York: Ronald Press, 1950.

10. Klopfer, B., Ainsworth, Mary, Klopfer, W. G., & Holt, R. R. *Developments in the Rorschach technique.* Vol. I. New York: World Book, 1954.

11. Machover, Karen. *Personality projection in the drawing of the human figure.* Springfield: Thomas, 1949.

12. Pascal, G. R., & Suttell, Barbara. *The Bender-Gestalt Test.* New York: Grune & Stratton, 1951.

13. Peek, R. M. Directionality of lines in the Bender-Gestalt Test. *J. consult. Psychol.*, 1953, *3*, 213-216.

14. Peek, R. M., & Quast, W. *A scoring system for the Bender-Gestalt Test.* Hastings, Minnesota, 1951.

15. Sakoda, J. M., Cohen, B. H., & Beall, G. Test of significance for a series of statistical tests. *Psychol. Bull.*, 1954, *51*, 172-175.

16. Terman, L. M., & Merrill, Maud. *Measuring intelligence.* New York: Houghton Mifflin, 1937.

17. Vorhaus, Pauline G. Rorschach configurations associated with reading disability. *J. proj. Tech.*, 1952, *16*, 3-19.

18. Wechsler, D. *Wechsler intelligence scale for children.* New York: Psychological Corp., 1949.

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The Influences of Color, Shading, and Welsh Anxiety Level on Elizur Rorschach Content Test Analyses of Anxiety and Hostility[1]

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A paper by Baughman (2) has cited empirical support for concluding that there is considerable consistency of behavior in the formal scoring properties of the Rorschach despite quite drastic changes in the stimulus dimensions. This study is designed to test another aspect of this hypothesis: to see if this consistency will also appear, despite experimental changing of the stimulus dimensions, when a Rorschach content analysis of anxiety and hostility is used.

This research represents an attempt to assess the role and possible interaction of two variables: anxiety level, as defined by the Welsh A scale (7), and two specific Rorschach stimulus dimensions, color and shading. The dependent variables are anxiety and hostility scores as measured by Elizur's Rorschach Content Test (RCT) (3). The effects of color will be studied by an analysis of differences in group RCT scores between a standard card series (Chr) and an achromatic series (Achr). Similarly, differences between series Achr and a silhouette series (Sil) will indicate shading effects. Differences between the Chr and Sil series will reflect the combined effects of color and shading. The composition and properties of the two experimental card series, Achr and Sil, are discussed more fully by Baughman (1).

The following predictions were made:

1. There will be no significant differences in the Elizur RCT measurements of anxiety (Elizur A) or hostility (Elizur H) between the groups differing in the three series of Rorschach stimuli (Chr, Achr, or Sil) received. Further, no interaction with anxiety level is expected. (This prediction indicates that the data will not permit rejection of the null hypothesis.)

2. There will be real differences in amounts of Elizur A and Elizur H elicited by individual Rorschach cards within each card series.

3. There will be a significantly positive correlation between Welsh A and Elizur A scores.

SUBJECTS AND PROCEDURE

A 173 item abbreviated form of the Minnesota Multiphasic Personality Inventory (MMPI), which included scale K, Welsh A, Welsh R, and Taylor A, was administered to 325 male undergraduates enrolled in the introductory psychology courses at the University of North Carolina. The protocols were scored for Welsh A, from which the anxiety groups were selected. The distribution of Welsh A scores for this entire group was positively skewed, ranging from 0 to 35 with a median score of 10.75, a mean of 12.46 and a standard deviation of 7.6.

The three anxiety groups (total N=90) were selected from this population: the low anxiety (Welsh LA) group had percentile scores of 10-20 (raw scores of 3, 4, and 5), the middle anxiety (Welsh MA) group had percentile scores of 45-55 (raw scores of 10, 11, or 12), and the high anxiety (Welsh HA) group had percentile scores of 80-90 (raw scores of 19, 20, 21, or 22). The distribution extremes were avoided on the hunch that the

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Ss within this range might be atypical in a number of respects not pertinent to the experiment.

No individuals were used as Ss if their MMPI K scale was over 23, this being a t score of 70 on the MMPI standardization group. Several such potential Ss had to be eliminated; they were all from the Welsh LA subject pool.

The 90 male Ss (30 at each of the three Welsh anxiety levels), selected on the basis of their Welsh A and K scale scores, were asked to participate in an experiment involving "perception". These Ss were informed that they had been randomly selected from their classes, and it seems unlikely that any of them were aware of any preselection criteria. None of the Ss admitted to having seen the Rorschach previously.

The examiner (a male second year graduate student) administered the free association part of the Rorschach to each S individually in one of two similar testing rooms. Thirty Ss (10 from each anxiety level) responded to the Chr series; similarly 30 more responded to the Achr series, and the remaining 30 to the Sil series. In this way, nine groups were formed with 10 Ss in each group.

Series Chr is the standard Rorschach card series, while series Achr is a photographic reproduction, in black and white, of series Chr, with closely similar light values. The five achromatic cards in the Chr series were used as the corresponding cards in the Achr series, so that only the five colored cards (II, III, VIII, IX, and X) actually differed between the two series. Series Sil was constructed by placing a solid coat of black india ink over all the shaded and colored areas of the regular Rorschach blots, forming solid black designs. These blots were photographed and mounted on comparable Rorschach cards, resulting in a series of solid black designs with similar shapes to the Chr and Achr series, but without differential light values and with a very marked figure-ground contrast.

Each S was asked to give four responses to each of the 10 Rorschach cards he saw, making a total of 40 responses per S and 400 responses for each of the nine groups. After the responses were scored for Elizur A and Elizur H, the scores for the four responses that each S gave to each of the 10 Rorschach cards were combined so that each S had one Elizur A and one Elizur H score on each card. Lindquist (6) designates this 3 x 3 x 10 triple classification with 10 scores per cell a type III analysis of variance design, in that each S is classified in a particular anxiety level-card series group while all Ss, regardless of their grouping, respond to the same third variable, the 10 Rorschach cards, in the same sequence.

Results

In respect to scorer reliability of the RCT measures, two judges (wives of graduate students) independently scored 30 protocols each after intensive training with the examiner. Judge A, rescoring the 30 protocols of the Chr group, obtained a Pearson product moment correlation of .90 for Elizur A and .94 for Elizur H with the examiner's scoring. Judge B, rescoring the 30 series Achr protocols, obtained Pearson correlations of .95 for Elizur A and .91 for Elizur H. The examiner rescored series Sil about a month after the original scoring and obtained Pearson correlations of .98 and .99 for Elizur A and H respectively with his previous scoring.

Table I shows a matrix of Pearson product moment correlations between the MMPI and RCT variables. These data are based on the 90 Ss participating in the study. No MMPI variable related significantly with either RCT measure.

Correlations were also computed separately for each of the three card series and three anxiety level groups for these variables, each of these groups consisting of 30 Ss. Some of these variables were significantly related within a particular subgroup,

TABLE I—Pearson Product Moment Correlations Between Variables for All 90 Subjects

	Taylor A	Elizur H	Elizur A	Welsh R	Welsh A
K	−.62**	−.02	−.06	.21*	−.73**
Taylor A		−.06	.00	−.09	.86**
Elizur H			.47**	−.03	−.05
Elizur A				.04	.03
Welsh R					−.05

* Significant at .05 level
** Significant at .01 level

but not within the total group, as shown by Table I. For example, in the Sil group K and Elizur A correlated −.38, significant at the .05 level. In the Welsh HA group Taylor A and Elizur H correlated −.37, which was both significantly different (at the .05 level) from zero and from the Welsh MA group, where r=.22.

K also apparently played a differential role for the Welsh MA and Welsh LA groups in the production of Elizur A and H. In the K-Elizur A relationship the Welsh MA group (r = −.43) was significantly different at the .05 level from the Welsh LA group (r=.34). Similarly, in the K-Elizur H relationship, although no one subgroup was found to be significantly different from zero, the Welsh MA group (r = −.27) and Welsh LA group (r=.29) differed at the .05 level.

THE RCT ANALYSES OF VARIANCE

Table II summarizes the results of six analyses of variance, three for Elizur A and three for Elizur H. These analyses were done on log transformed data since there were highly significant relationships between cell means and variances of the original data. Separate analyses were done for the colored (Cards II, III, VIII, IX, and X) and non-colored (Cards I, IV, V, VI, and VII), as well as for all 10 cards together, for both Elizur A and H because the five non-colored cards were identical in series Achr and Chr. A nonsignificant difference between these series might be an artifact of this similarity.

Table II shows that, considering all 10 Rorschach cards together, only the individual cards themselves are a significant source of variation, both for Elizur A and H. Table III shows the Elizur A means for the 10 Rorschach cards in each card series; Table IV shows the Elizur H mean scores for the 10 Rorschach cards in each card series.

The further analyses of the data, which broke the cards down into the colored and non-colored cards, complicated the picture considerably and

TABLE II—Significant Probability Levels for Elizur A and H Under the 3 Anxiety Levels, 3 Card Series, and Rorschach Cards

Source	*All 10 Cards*		*5 Colored Cards*		*5 Non-colored*	
	Elizur A	Elizur H	Elizur A	Elizur H	Elizur A	Elizur H
Rorschach Cards	P<.001	P<.01	P<.10	P<.01	P<.001	
Card Series					P<.01	
Welsh Anxiety Level						
Rorschach Cards X Card Series						
Rorschach Cards X Welsh Anxiety Level			P<.001			P<.05
Rorschach Cards X Card Series X Welsh Anxiety Level						

TABLE III—Elizur A Means for the 10 Rorschach Cards in Each Card Series

	I	II	III	IV	V	VI	VII	VIII	IX	X	Total
Chr	.45	.32	.30	.43	.37	.32	.29	.34	.38	.34	.35
Achr	.49	.29	.30	.32	.28	.26	.26	.35	.36	.36	.33
Sil	.42	.30	.26	.26	.37	.21	.20	.30	.44	.36	.31
Total	.45	.31	.29	.335	.339	.26	.25	.333	.39	.35	.33

TABLE IV—Elizur H Means for the 10 Rorschach Cards in Each Card Series

	I	II	III	IV	V	VI	VII	VIII	IX	X	Total
Chr	.26	.36	.32	.31	.34	.38	.32	.32	.40	.30	.33
Achr	.34	.43	.29	.32	.36	.30	.34	.37	.46	.31	.35
Sil	.28	.34	.33	.36	.36	.36	.24	.31	.44	.34	.34
Total	.29	.38	.31	.33	.36	.35	.30	.33	.43	.31	.34

indicated there may well have been subtle influences of the color, shading, and anxiety level on the RCT variables. The analyses showed that some interactions appeared in these further breakdowns that affected the colored or non-colored cards differentially, but did not hold up for all 10 cards together.

In the separate analysis of the five colored cards for Elizur A the interaction between card series and anxiety levels was significant at the .001 level. In this interaction it is apparent that the Welsh MA group is contributing most of the variance, being low on the Chr series, but quite high on the Achr and Sil series. Table V shows the mean Elizur A scores for all 10 Rorschach cards, the five colored, and the five non-colored cards in each of the nine experimental groups.

In the analysis of the non-colored cards, there was also a significant difference between card series. The means for the non-colored Rorschach cards can be seen in Table III; the total means for the non-colored card series can be seen in Table V. The difference between the Chr and the Achr series appeared in the non-colored cards despite the fact that the non-colored cards are identical in these two series.

It was apparent that the experimental groups were not equated on a hostility measure, and, therefore, a comparison between the card series groups is not warranted. For example, on Card I which is identical on the Chr and Achr series, the mean Elizur H score of the Welsh HA-Chr group was .13, while the mean of the Welsh HA-Achr group was .30.

DISCUSSION

Two of the three predictions were confirmed by the analyses of variance if the 10 Rorschach cards are considered together. In this way the data support prediction one and the formulation concerning the minimal effects

TABLE V—Mean Elizur A Scores in the Nine Subgroups

		Card Series			
		Chr	Achr	Sil	Total
Welsh HA	All 10 Cards	.36	.32	.32	.33
	Colored Cards	.37	.31	.31	.33
	Non-colored Cards	.36	.32	.33	.34
Welsh MA	All 10 Cards	.31	.35	.33	.33
	Colored Cards	.26	.40	.37	.34
	Non-colored Cards	.36	.31	.28	.32
Welsh LA	All 10 Cards	.39	.31	.28	.33
	Colored Cards	.38	.29	.31	.33
	Non-colored Cards	.40	.34	.26	.33
Total	All 10 Cards	.35	.33	.31	.33
	Colored Cards	.34	.33	.33	.33
	Non-colored Cards	.37	.32	.29	.33

of color and shading in affecting response behavior.

Prediction two was also confirmed; the 10 Rorschach cards, considered together, differed significantly in the amounts of Elizur A and H elicited. Although these results must be considered with caution due to the confounding effects of the stabilized card order, the data may be interpreted in support of Baughman's hypothesis concerning the importance of geometrical form and figure-ground dimensions of the stimuli in determining responses.

There was no relationship found between either of the MMPI anxiety measures and either RCT score; this refuted prediction three and warns psychologists not to equate the anxiety measures derived from the two tests. The differences between the anxiety measures from the two tests should be emphasized; the Welsh A scale is composed of MMPI items which have been found to empirically differentiate criterion groups, while the RCT appears to reflect a readiness to verbalize perceptions that are judged to be of anxious or hostile content.

Similarly, the failure of Taylor A to correlate significantly with Elizur A contradicts the earlier work of Goodstein (4). However, several differences in design may have been responsible for the failure of this study to replicate Goodstein's data, besides the possibility that Elizur A scoring may not have been comparable between the two studies. Goodstein administered the Rorschach to his Ss in group form and used a statistical technique (partial correlation) to control the effects of the number of responses given.

The further analyses, which broke the Rorschach cards into the colored and non-colored cards, indicated the possibility that there were some differential color effects within the 10 Rorschach cards. For example, real differences in Elizur A appeared between card series with the non-colored cards, but not for the colored cards or all 10 Rorschach cards. Since, as previously noted, the five non-colored cards are the same in both the Chr and Achr series, this difference in Elizur A (between the Chr and Achr series) must in some way be related to the colored cards II and III which do change between series Chr and Achr. One possibility is that the sudden introduction of blood-red color in the series Chr cards caused feelings of anxiety which were released only on the non-colored cards. This possibility, of course, did not exist on the Achr series where the means for the colored and non-colored cards were very similar. A further analysis also indicated similar (non-significant) amounts of Elizur A were produced on each colored Rorschach card, while the non-colored cards produced significantly different amounts. The expression of Elizur A, then, although apparently facilitated by the color was most differentially measured by the non-colored cards.

The Elizur A data for each Rorschach card in each of the card series supports the above interpretation. Table III shows that Rorschach card I, which was always presented first, increased slightly from the Chr to the Achr series. The decrease from the Chr to the Achr series became less pronounced the further the cards were, in sequence, from the colored cards II and III; the decrease being greatest on card IV and then progressively less on V, VI, and VII. If series Achr is used as a comparison baseline in evaluating the effect of the color it seems as if the red on cards II and III produced an outburst of Elizur A responses on card IV and then a general recovery until there was only a slight effect left on card VII. Again on the last three cards, which are colored in the Chr series, there was little difference between the Achr and Chr series. It appears, then, color has made a real difference in the production of Elizur A in this group of subjects, although the difference is not seen in the direct comparison of the colored cards in the Chr and Achr series, but in the comparisons of the non-colored cards between the Chr

and Achr series.

While the effects of color and shading did not seem to influence the production of Elizur A on the colored cards per se, there was a very significant interaction of Elizur A scores between anxiety level and card series. The Welsh HA and Welsh LA groups had similar patterns; in both cases the Chr series Elizur A means were much higher than the Achr or Sil series (see Table V). This trend was reversed in the Welsh MA group, the mean scores in series Chr being lower than either the Achr or Sil series. The Welsh MA-Chr group produced the lowest Elizur A scores in all nine experimental groups on the colored cards, while Welsh MA-Achr and Welsh MA-Sil were the two highest on the colored cards.

Again by using the Achr series as a comparison baseline for evaluation, the color seemed to differentially inhibit the Welsh MA group in expressing Elizur A. On the other hand, the Welsh MA group produced significantly more Elizur A than the other two anxiety groups on the Achr and Sil series. Both the Welsh HA and Welsh LA groups expressed more Elizur A on the Chr series (both on the colored and non-colored cards) than on the Achr or Sil series. In this study the Welsh MA group reacted as Levy and Kurz (5) might predict a Welsh HA group should, in that the color differentially seemed more connotatively important to them.

Summary

This study investigated the effects of color, shading, and anxiety level on the production of anxious and hostile content on the Rorschach test, as measured by Elizur's Rorschach Content Test. Ninety males were selected from 325 male undergraduates on the basis of their Welsh A scores, an anxiety scale from the Minnesota Multiphasic Personality Inventory (MMPI). Thirty of these Ss were a high anxiety group (Welsh HA), 30 a middle anxiety group (Welsh MA), and the remaining 30 a low anxiety group (Welsh LA). Ten of the Ss from each anxiety level were given the free association part of the Rorschach with the standard chromatic series (Chr), 10 with an achromatic series (Achr), and 10 with a silhouette series (Sil). This made a total of nine experimental groups, each of which had 10 Ss.

Results were as follows:

1. Considering all 10 Rorschach cards together, Elizur A (anxiety) and H (hostility) scores were not influenced by the presence or absence of color or shading. However, further analyses indicated that color did facilitate the production of Elizur A scores when comparisons of the non-colored cards (I, IV, V, VI, VII) were made between the Chr and Achr series.

2. There were real differences in Elizur A and H between the Rorschach cards. Although these results were confounded with the fixed presentation order, the data suggest the importance of geometrical form and figure-ground dimensions of the stimuli in determining responses.

3. No significant correlations were found between the Elizur A scores and either the Welsh A or Taylor A scores. These results warn psychologists not to equate the anxiety measures derived from the two tests.

4. Correlational results indicated the MMPI variable K interacted with Welsh A in the production of Elizur A and H for the 30 Ss in the Welsh MA, Welsh LA, and Sil groups. There were negative relationships between K and Elizur A and H in the Welsh MA and Sil groups, positive in the Welsh LA group.

References

1. Baughman, E.E. A comparative analysis of Rorschach forms with altered stimulus characteristics. *J. proj. Tech.*, 1954, *18*, 151-164.

2. Baughman, E. E. The role of the stimulus in Rorschach responses. *Psychol. Bull.* 1958, *55*, 121-147.

3. Elizur, A. Content analysis of the Rorschach with regard to anxiety and hostility. *J. proj. Tech.*, 1949, *13*, 247-284.

4. Goodstein, L. D. Interrelationships among

several measures of anxiety and hostility. *J. consult. Psychol.*, 1954, *18*, 35-39.

5. Levy, H. L., & Kurz, R. B. The connotative impact of color on the Rorschach and its relation to manifest anxiety. *J. Pers.*, 1957, *25*, 617-625.

6. Lindquist, E. F. *Design and analysis of experiments in psychology and education.* Boston: Houghton Mifflin Co., 1953.

7. Welsh, G. S. Factor dimensions A and R. In G. S. Welsh & W. G. Dahlstrom (Eds.), *Basic readings on the MMPI in psychology and medicine.* Minneapolis: University of Minnesota Press, 1956, pp. 264-281.

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Rorschach Schizophrenic Score (RSS)[1]

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INTRODUCTION

The Ishihara test is applicable to color blindness, and intelligence tests to mental deficiency, each having diagnostic effectiveness. Our concern is with the lack of an equally specific test for the diagnosis of schizophrenia. Though the Rorschach seems to be most effective among psychological tests for the diagnosis of this condition, even this test can not be thought of as a conclusive method. The author, however, believes that the Rorschach can be made a more effective instrument for the diagnosis of schizophrenia by improving the analysis of test protocols. Research on schizophrenia by this method, initiated by Rorschach (16), has continued over thirty years. As the history of the research in this period is described in detail by Klopfer & Kelley (8), and later developments have been referred to in the author's textbook (6), the historical description will not be repeated here.

The difficulty we must first face in research on schizophrenia by means of the Rorschach is the obscurity of definitions of schizophrenia. The second difficulty is the problem of sub-type classification. These have been pointed out by Kendig (7) and we, also, have met the same difficulties. Since we have no way of settling these problems at present, we have decided to take the presently popular psychiatric view. Despite some differences in the conception of schizophrenia, and disregarding the problem of sub-type classification, it is, fortunately, a fact that certain common characteristics are found in some of the Rorschach protocols of patients diagnosed definitely as schizophrenia.

As Piotrowski (11) has mentioned, the methods of analysis of the protocol may be classified into three groups; "pathognomonic", "tabular", and "systematic". The "systematic" diagnosis which he thought best is complicated and contains procedural difficulties that preclude general application.

First we examined the general Rorschach signs, and next the form-level rating supplemented by Friedman's (4) ideas; further we adapted Bühler's "Basic Rorschach Score" (3), and finally Watkins & Stauffacher's "Indices of Pathological Thinking" (19). Thus we intended to employ a many-sided approach to schizophrenia through a synthetic adaption of several methods which are amenable to quantitative analysis. Taking into account that the differential diagnosis between schizophrenia and psychoneurosis is often debatable clinically, we considered comparisons between these two groups in relation to normal adults. Here we assume a hypothesis of lower degrees of personality adjustment from normal to psychoneurosis to schizophrenia. Accordingly, the *Rorschach Schizophrenic Score* (RSS) that we are investigating here will be of use both for the purpose of differentiating between schizophrenia and psychoneurosis, and between schizophrenia and adult normal.

The purpose of our research is to discover a RSS by extensively re-examining the various Rorschach indices which have been regarded as characterizing schizophrenia and by synthetically treating the several indices which

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have been found to be effective in diagnosing schizophrenia.

METHOD

Subjects: The subjects consisted of three groups; 30 schizophrenics, 30 psychoneurotics and 30 normal adults. Characteristics of each group are as follows:

1) Schizophrenic Group (SGr.)

The members of this group were patients of the Psychiatric Department of Konodai National Hospital, and were diagnosed as schizophrenia by more than two psychiatrists. Their terms of hospitalization ranged from four months to three years. All were chronic schizophrenics. Cases of mental deficiency or organic brain damage were excluded. We did not select samples on the basis of the Rorschach, except for excluding cases with fewer than 10 responses.

2) Psychoneurotic Group (PGr.)

This group consisted of psychoneurotic patients who had visited the National Institute of Mental Health. They were selected to be nearly comparable to SGr. in age, educational level, socio-economic level, and so on. This group consisted of eight anxiety neurotics, three hysterics, five obsessive-compulsive neurotics, six neurasthenics, and eight neurotics of mixed type.

3) Normal Group (NGr.)

The subjects of this group were well-adjusted adults who had never sought psychiatric treatment.

In these groups, the number of each sex were made equal and socio-economic levels ranged from low to upper class. Education ranged from 6 to 16 and age ranged from 18 to 36, with an average of about 28 years. These conditions were made equal in each group.

Scoring: The scoring of the Rorschach records was done by the author according to Klopfer's method. The author's modified method (6) was used for evaluation of form-level and Friedman's categories (4) were added. In analyzing the response verbalizations, Watkins & Stauffacher's categories (19) were used. The scoring system which was used is as follows:

1) General Scoring Categories

The following 32 items were picked from Klopfer's scoring categories: R, Rej. T/R_1, T/R_1, (chrom), T/R_1, (achrom), W, W%, D, D%, Dd, Dd%, S, S%, M, FM, m, C, CF, FC, C', K, FK, k, c, Fc, Sum C, F%, A%, At%, Sex, P, P%. Among these only P% was modified from the conventional $P\% = P/R \times 100$. P% increases for a while in proportion to the increase of R and then decreases abruptly. The following equation was adopted; $P/25 \times 100$, so that if R amounts to 25, most of P should appear. The above items were used as single signs and the ratios between these signs (e.g. experience balance) were omitted. In preliminary experiments these ratios proved not to be amenable to the present method of handling the data.

2) Evaluation of Form-Level

The problem of evaluation of form-level is very important and difficult. Its historical development has been described by the author (6) who accepts the validity of Klopfer's method.

But as Klopfer's method complicates the inquiry, it was necessary to simplify the method. The author set four levels of form; superior (+), good (±), poor (∓), pathological (−). The object of this evaluation is not only pure F responses, but all of the primary form responses, and in the calculation of F+%, both + and ± are grouped as + and both ∓ and − as −. There are two kinds of F+% calculations, one for the pure form responses and the other for all the primary form responses (F, M, FM, FC, FC', Fc, Fk, FK, etc.). Accordingly, the accompanying formulae, at the head of next page were used.

In addition to this method of expressing the form-level in F+%, we employed Friedman's method of rating form-level in relation to location.

$$F+\% = \frac{(F+) + (F\pm)}{\text{Sum F}} \times 100$$

$$R+\% = \frac{(F+) + (F\pm) + (M+) + (M\pm) \ldots + (FK\pm)}{\text{Sum } (F+M+FM \ldots FK)} \times 100$$

He classified W and D respectively into seven categories in accordance with the degrees of form quality. Among these, two categories, W− and D−, were rated by the author's modified method. W−% and D−% were calculated respectively from W−/W and D−/D. Other categories used by Friedman were omitted for they were less effective than W− and D− in preliminary experiments.

3) Basic Rorschach Score (BRS)

In our experience the BRS is useful in characterizing the schizophrenic group; the BRS of Bühler's (3) schizophrenic group is astonishingly similar to that of our SGr. But the BRS of their psychoneurotic group is far above that of ours. Considering the fact, however, that Hamlin et al (5) found a BRS rather near ours, it is evident that the difference should not be attributed to differences between Americans and Japanese. The BRS was simplified on the ground of practical necessity, and the weightings of the items were revised in terms of Japanese traits. The provisional modified BRS is composed of only 37 items (See Appendix). In the preliminary experiment the modified BRS, so far as it concerned our samples, was more discriminating than that of the original BRS, but both were used in this study.

4) Analysis of Verbalization

While Rorschach demonstrated that the pathological thinking of schizophrenia is projected on the Rorschach blots, the problem was more crucially investigated by Rapaport (14). What he has called "deviant verbalization" can be estimated quantitatively, though not too satisfactorily. We have some doubt about his classification, but have not yet come to a final conclusion. Accordingly, our classification follows generally that of Watkins & Stauffacher (19) which made possible a quantitative estimate of deviant verbalization.

A. ($\triangle$ value = .25)
   1) Fabulized response; FR
   2) Peculiar verbalization; PV
   3) Mangled or distorted concept; MDC

B. ($\triangle$ value = .50)
   1) Fabulized combination; FA
   2) Symbolic response; Sym
   3) Deterioration color; DC

C. ($\triangle$ value = 1.00)
   1) Confabulation; Conf
   2) Contamination; Cont
   3) Autistic logic; AL
   4) Queer verbalization; QV
   5) Incoherence; Incoh
   6) Perseveration; Pers

The above list omits Confusion, Relationship Verbalization and Absurd Response, but these responses were regarded as belonging to Conf, PV, and QV. And Vagueness was omitted, as it had been dealt with in the categories of form-level. Newly added Perseveration was given a $\triangle$ value of 1.00 for more than four repetitions and a $\triangle$ value of .50 in the case of three or four repetitions. Watkins & Stauffacher assign $\triangle$ values according to the degree of deviation, even in one and the same category, but as it makes the judgement complicated, the $\triangle$ values were fixed except in the cases of Perseveration. With the above exceptions, we summed the $\triangle$ values by the same method as Watkins & Stauffacher and calculated $\triangle$% by the following formula.

$$\triangle\% = \frac{\text{Sum } (\triangle \text{value} \times \text{frequency})}{R} \times 100$$

Statistical treatment of data: The data regarding the above four classifications—1) general categories, 2)

form-level, 3) BRS, 4) $\Delta\%$ — were examined first by the differences between means in the combinations of SGr. to PGr., SGr. to NGr., and PGr. to NGr. and when the differences were large in variance, they were tested by Cochran & Cox's method. In this way those factors were selected which showed, at the .01 level, a significant difference between SGr. and PGr. and between SGr. and NGr., and the relationships among these factors were pursued. And finally these factors were synthesized by Fisher's discriminant function into the RSS whose validity was examined.

RESULTS

1) General Scoring Categories

In Table I are shown the means and standard deviations for each group of the 32 Rorschach variables. It is evident from the F-test for difference between means of each group that the differences between SGr. and NGr. tend to be greater and those between PGr. and NGr. lower. P and P% are the factors which discriminate between SGr. and PGr. most significantly. The correlation between these two factors is .859 in SGr. and .598 in PGr. F-tests of differences between SGr. and PGr.

TABLE I—Comparison of Schizophrenic, Psychoneurotic and Normal Groups on Thirty Two Formal Rorschach Scores.

Sign	S		P		N	
	Mean	s	Mean	s	Mean	s
R	20.3	8.43	27.4	16.35	25.9	11.43
Rej	0.4	0.62	0.2	0.61	0.2	0.37
T/R_1	23.5	4.68	32.4	20.18	23.3	13.81
T/R_1 (chrom)	23.2	14.17	31.9	19.03	19.8	9.36
T/R_1 (achrom)	23.7	21.09	33.2	24.70	25.7	20.71
W	9.7	5.71	9.9	5.44	9.4	5.93
W%	48.9	18.04	41.2	21.94	39.0	17.98
D	8.9	5.65	14.9	12.76	13.1	7.29
D%	42.8	15.98	51.1	21.27	50.8	12.87
Dd	1.3	1.56	2.1	4.03	2.4	2.69
Dd%	6.8	7.42	6.2	7.41	8.6	9.49
S	0.6	0.79	0.7	0.76	0.9	1.73
S%	1.8	4.29	1.6	3.30	1.2	2.43
M	2.3	2.19	3.6	3.06	3.1	1.94
FM	2.1	1.91	3.4	2.93	3.4	2.48
m	0.4	0.49	0.7	1.72	0.4	0.57
k	0.3	1.27	0.4	0.68	0.4	0.93
K	0.3	0.66	0.5	0.86	0.2	0.37
FK	0.3	0.48	0.7	1.02	1.1	1.10
c	0.2	0.48	0.4	0.26	0.2	0.59
Fc	0.8	1.02	1.5	1.41	2.0	2.10
C′	1.0	0.33	1.4	1.57	0.7	0.85
C	0.2	0.50	0.2	0.61	0.1	0.14
CF	1.5	1.99	1.9	1.66	1.2	1.15
FC	1.51	2.11	1.9	2.26	2.7	2.51
Sum C	2.6	1.73	3.1	2.38	2.6	1.07
F%	53.5	16.32	45.5	15.42	43.8	14.15
A%	44.7	16.03	43.1	16.68	50.4	14.43
At%	10.2	15.46	7.2	6.96	3.4	3.29
Sex	0.4	1.48	0.7	1.80	0.0	0.00
P	3.4	1.75	5.6	1.62	6.1	1.52
P%	19.1	11.06	27.3	8.00	29.4	10.48

TABLE II—Comparison of Three Groups on Various Form-Level Scores.

Sign	S		P		N	
	Mean	s	Mean	s	Mean	s
F+%	46.0	25.76	64.3	16.38	78.8	16.20
R+%	47.3	22.45	68.4	12.04	77.6	13.78
W−%	34.0	22.76	11.4	11.37	3.6	5.93
D−%	21.0	29.38	7.0	11.53	2.6	6.27

TABLE III—Comparison of Three Groups on BRS and Modified BRS

	S		P		N	
	Mean	s	Mean	s	Mean	s
BRS	−24.5	10.75	−10.4	14.02	−3.9	13.89
BRS (Mod.)	−38.8	5.06	−14.5	14.41	−0.7	15.79

TABLE IV—Comparison of Three Groups on Sum Δ and Δ %.

Sign	S		P		N	
	Mean	s	Mean	s	Mean	s
Sum Δ	3.40	2.74	1.67	1.71	0.50	0.42
Δ %	17.70	14.41	5.15	3.91	1.80	2.17

were made: for P, $F = 25.47$; and for P%, $F = 10.82$. Our decision was to include P rather than P% in the RSS.

2) Form-Level

Table II shows the comparison of means and standard deviations of F+%, R+%, W−%, D−% for the three groups. With the exception of D−%, differences between SGr. and PGr. are significant at the .005 level.

But there were high correlations between F+% and R+%: $r = .912$ in SGr. and .692 in PGr. The comparison between SGr. and PGr. was as follows: for F+%, $F = 10.78$; for R+%, $F = 20.56$. Consequently R+%, with the larger F value, was chosen for the RSS. W−% shows a negative correlation with R+%: $r = -.756$ in SGr. and $-.242$ in PGr. Therefore W−% was adopted. The difference between means of W−% in both groups yielded an F of 23.67.

3) Basic Rorschach Score

BRS and modified BRS values for each group are shown in Table III. Both BRS and modified BRS successfully distinguished SGr. from the others, but it is evident that the differences are larger when the modified BRS is used.

The difference between means of SGr. and PGr. on the modified BRS yields an F of 75.97, which, despite the large difference in variance ($v^2/u^2 = 8.13$) is significant at the .005 level. The comparison of BRS means yields an F of 19.11, significant at the .005 level.

4) Analysis of Verbalization

What is called "deviant verbalization" is quantified in the figures: Sum Δ and Δ%. Table IV shows the means and standard deviations of these two scales.

Both Sum Δ and Δ% are successful in distinguishing between SGr. and PGr. at the .01 level. Δ%, yielding an F of 21.02, was selected for RSS. For Sum Δ, $F = 8.63$.

5) Syntheses by Discriminant Function

By means of the above four analyses, the following were found effective in differentiating between SGr. and PGr.: number of popular responses from the scoring categories, R+%, W−% as a measure of form-level, the modified form of BRS, and Δ%. These five factors distinguish between the psychoneurotic and psychotic groups at the .005 level ($F = 20.56$-75.97). Though the modified form of BRS is very effective in itself in distinguishing SGr. from PGr., we next employed the discriminant function to maximize the power of the five variables to discriminate between SGr. and PGr. The solutions of an equation of the first degree regarding these five factors are as follows:

$$\lambda_1 (R+\%) = 0.23587 \times 10^{-3}$$
$$\lambda_2 (W-\%) = -0.12410 \times 10^{-3}$$
$$\lambda_3 (P) = 4.06679 \times 10^{-3}$$
$$\lambda_4 (\Delta\%) = -0.99493 \times 10^{-3}$$
$$\lambda_5 (BRS) = 1.22327 \times 10^{-3}$$

According to these solutions, Zij, with respect to values x_1ij, x_2ij, x_3ij, x_4ij, x_5ij, can be calculated by the next formula as shown in Table V.

$$Zij = x_1ij + x_2ij \ldots\ldots + x_5ij$$

Here, for the convenience of calcula-

TABLE V—Comparison of Three Groups in z Scores of Each Subject.

	1	2	3	4	5	6	7	8	9	10
S	−32.25	− 5.56	−70.85	−45.82	−17.47	−65.92	−17.07	−72.26	− 1.63	−31.12
P	26.07	27.51	56.08	25.15	− 2.74	29.52	−27.40	40.82	−14.81	9.39
N	25.60	58.96	65.10	− 0.70	10.36	59.52	66.32	35.24	54.51	53.01
	11	12	13	14	15	16	17	18	19	20
S	−73.38	−114.15	−15.24	−14.63	− 4.95	7.72	−54.19	−31.03	−54.39	− 7.62
P	36.37	0.78	26.30	36.12	18.92	9.48	24.73	7.38	20.39	1.92
N	40.75	49.33	54.97	27.98	84.90	75.59	16.03	30.06	59.58	41.17
	21	22	23	24	25	26	27	28	29	30
S	−70.63	−34.90	−137.39	−100.63	−87.65	−29.84	−32.08	−91.57	15.28	−13.12
P	31.32	− 8.91	56.82	2.30	−35.03	−20.24	14.28	17.61	47.14	0.39
N	30.37	45.90	14.95	19.66	23.05	67.57	29.16	36.45	12.78	85.97

	Mean
S	−43.49
P	15.23
N	42.47

tion, values were respectively multiplied by 1.000, and cut off at two decimals: R+% = 0.24, W−% = −0.12, P = 4.07, Δ% = −0.99, BRS = 1.22.

Table V shows the z scores of each group, λ values obtained by comparing SGr. with PGr. were assigned to the data of NGr. To obtain an average of the means of Z values for SGr. and PGr., the following formula was used.

$$Z = \tfrac{1}{2}(-43.49 + 15.23) = -14.13$$

This value is the cutoff point for discrimination between SGr. and PGr. As Table V shows there are 24 subjects (77%) in SGr. with $Z \leqq -14.13$, 4 in PGr. (13%) and none in NGr.

Accordingly, we decided to call a Z value of −14.13 or lower "Rorschach Schizophrenic Score" (RSS). The discrimination of this RSS seems to us more effective in classifying schizophrenia than the BRS alone.

DISCUSSION

Among 32 items from the formal scoring categories, only P and P% were found to discriminate at the .01 level between SGr. and PGr. If P responses are considered, as Allen (1) observed, to reflect social conciliation, acceptance of convention in real life, and as Phillips & Smith (10) claimed, to be related to the degree of acceptance of the traditional ways of action or socialization, the lowness of P in SGr. can be theoretically understood. Indeed Rieman (15) has reported that schizophrenic out-patients did not show significantly fewer P response than psychoneurotics. Also in our experience, rather high P responses are not uncommon among those schizophrenics who have comparatively high rapport and high intellectual level.

On the author's ratings of form-level, some differences between SGr. and PGr. occurred at the .01 level. The fact that what is called good form-level is low among schizophrenics is unanimously maintained by various views (in general, however, paranoid schizophrenia is said to be an exception). Beck (2) maintains that form-quality reflects ability to test reality and ego strength. Yet, as F+% correlates highly with intellectual level, it is very interesting that it is low in schizophrenia without mental deficiency. While Rieman (15) found no difference in P response, he found a difference significant at the .05 level in form-level. Friedman's (4) analyses of form-level according to location categories showed that schizophrenics' perceptual responses were in some respects like children's, and that in other respects they stood between children and adults. He concluded that despite indications of some perceptual regression, there remain functions of higher developmental levels. According to his report, the mean value of W−% in SGr. is 22%, and in the normal adult

group, 0%. The difference is significant at the .01 level. But in D−%, the mean values of SGr. and NGr. are 26% and 14% respectively, and the difference is significant at the .05 level. Accordingly, W−% characterizes schizophrenia more definitely as our results indicate. In other words, the failure to grasp the form in W response is more distinctive than in D responses. Accordingly, among schizophrenics with comparatively high W%, F+% is lowered mainly by W− responses.

BRS was developed by Bühler in order to measure the integration level of personality. The score value decreases in the following order: normals, psychoneurotics, mental defectives and schizophrenics. While some degree of discrimination between psychoneurosis and schizophrenia is achieved by means of the BRS alone, discrimination is improved by our modified BRS.

The matter that demands special attention, however, is that the four integration levels shown by Bühler (adequacy, conflict, defect, loss of reality) and their defining scores do not agree with our findings. Therefore, we question the relative value of BRS alone.

The scores for the △ value presented by Watkins & Stauffacher (19) were examined later by Powers & Hamlin (13), Nagasaka & Matsuoka (9). Watkins & Stauffacher reported △ values of psychotics, psychoneurotics and normal adults as respectively, more than 10%, 5-10%, less than 5%. Powers & Hamlin reported mean values of △% as 33.5% in catatonic schizophrenia, 21.0% in paranoid schizophrenia, 20.53% in latent schizophrenia, 11.4% in psychoneurosis and 5.62% for normals. In Nagasaka's reports, they are: 22.9% in schizophrenia, 7.08% in psychoneurosis and 2.18% in normals. The values in our research are about the same as Nagasaka's and for the most part coincide with those of Watkins & Stauffacher.

As mentioned above these four methods of analysis are efficient in classifying schizophrenia and in discriminating between schizophrenia and psychoneurosis. Consequently it can easily be supposed that they become more effective when synthesized. In order to solve this problem mathematically, we adopted Fisher's discriminant function, set a RSS at the cut-off point as an objective method for diagnosing schizophrenia through the Rorschach. The RSS classified 77% of SGr. as schizophrenic as compared to 63% classified by the BRS. Much more research will be necessary to determine whether the RSS of −14.13 is the best cut-off point for other patients than those of our samples.

Grayson (17) once criticized the BRS on two counts. They are: 1) sequence analysis by location and content are wholly omitted from the sign list, and 2) the list ignores content symbolism which provides rich clues to personality dynamics. These criticism may also apply to RSS. Nevertheless, we wished to formulate a measurement method that can be used quantitatively and objectively. Similar goals were sought in Piotrowski's (12) alpha-formula and Taulbee & Sisson's (18) pattern analysis. RSS seems to have a wider sphere of application.

We are faced with the questions of what aspects or function of personality RSS measures and which types of schizophrenia or psychoneurosis RSS most successfully discriminates. We have neither the theories nor sufficient data to answer them. But it may safely be said that in cases of schizophrenia with good rapport, high intellectual level and without general collapse of personality, misclassification will often occur. The limits of effectiveness of the RSS can not be specified without further research.

Summary

"Rorschach Schizophrenic Score" (RSS) provides a method for an objective and quantitative analysis of Rorschach protocols with the purpose of differentating schizophrenia from other clinical groups, especially psychoneurosis.

RSS was first developed to include 1) formal scoring categories, 2) form-level ratings, 3) Bühler's Basic Rorschach Score, and 4) Watkins & Stauffacher's $\Delta\%$.

As a result, it was found that P, R+% (including all the primary form responses), W−%, BRS and $\Delta\%$ differentiated the schizophrenic group from psychoneurotics and normals at the .005 level (F-test). Hence these five factors were synthesized by Fisher's discriminant function.

We obtained by this statistical method a Z score of −14.13, which was the cut-off point between schizophrenia and psychoneurosis. Thus $Z \leqq -14.13$ was called "Rorschach Schizophrenic Score" and 77% of the schizophrenic group, 13% of the psychoneurotics and none of the normals were classified as schizophrenic.

REFERENCES

1. Allen, R. M. *Elements of Rorschach interpretation.* New York: International Univ. Press, 1954.
2. Beck, S. J. *Rorschach's test,* Vol. II. New York: Grune & Stratton, 1945.
3. Bühler, Charlotte et al. *Development of the Basic Rorschach Score with manual of directions.* Los Angeles: Western Psychol. Services, 1949.
4. Friedman, H. Perceptual regression in schizophrenia. *J. proj. Tech.*, 1953, *17*, 171-185.
5. Hamlin, R. M. et al. Changes in adjustment following psychotherapy as reflected in Rorschach signs. In *"Success in psychotherapy"*, 1952.
6. Kataguchi, Y. *Psychodiagnostic technique: The Rorschach.* Tokyo: Maki Book Co., 1956.
7. Kendig, Isabel V. Rorschach indications for the diagnosis of schizophrenia. *J. proj. Tech.*, 1949, *13*, 142-149.
8. Klopfer, B. & Kelley, D. M. *The Rorschach technique.* New York: World Book Co., 1942.
9. Nagasaka, G. Rorschach test. In *Contemporary progress in psychiatry.* Tokyo: Ishiyaku Publ., 1957.
10. Phillips, Leslie & Smith, J. G. *Rorschach interpretation: Advanced technique.* New York: Grune & Stratton, 1953.
11. Piotrowski, Z. A. Experimental psychological diagnosis of mild form of schizophrenia. *Rorschach Res. Exch.*, 1945, *9*, 189-200.
12. Piotrowski, Z. A. An experimental Rorschach diagnostic aid for some forms of schizophrenia. *Amer. J. Psychiat.*, 1950, *107*, 360-366.
13. Powers, W. T. & Hamlin, R. M. Relationship between diagnosic category and deviant verbalizations on the Rorschach. *J. consult. Psychol.*, 1955, *19*, 120-124.
14. Rapaport, D., Gill, M. & Schafer, R. *Diagnostic psychological testing.* Vol. II. Chicago: Year Book Publ., 1946.
15. Rieman, G. W. The effectiveness of Rorschach elements in the discrimination between neurotic and ambulatory schizophrenic subjects. *J. consult. Psychol.*, 1953, *17*, 25-31.
16. Rorschach, H. *Psychodiagnostik.* Bern: Hans Huber, 1921.
17. Symposium on "Basic Rorschach Score". *Rorschach Res. Exch., & J. proj. Tech.*, 1949, *13*, 6-24.
18. Taulbee, E. S. & Sisson, B. D. Rorschach pattern analysis in schizophrenia. *J. clin. Psychol.*, 1954, *10*, 80-82.
19. Watkins, J. G. & Stauffacher, J. C. An index of pathological thinking in the Rorschach. *J. proj. Tech.*, 1952, *16*, 276-286.

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APPENDIX

(Modified Form of Basic Rorschach Score)

No.	Item	+	−	No.	Item	+	−	No.	Item	+	−
1a	R $\leqq$ 24		4	8a	k + K = 0.5-1.5	1		15b	FC > CF + C	3	
1b	R $\geqq$ 25	4		8b	k + K $\geqq$ 2		1	16	CF + C $\geqq$ 3		2
2	Rejection $\geqq$ 1		3	9a	FK = 0		3	17a	Sum C $\leqq$ 2.5		3
3	$T/R_1 > 30''$		2	9b	FK = 0.5-2.5	2		17b	Sum C $\geqq$ 3	3	
4a	M = 0-1		3	10a	F% $\leqq$ 20		1	18	T/R_1 diff. > 10″		1
4b	M = 1.5-2		1	10b	F% = 21-40	5		19a	W : M = 1 : 2		2
4c	M = 2.5-3.5	1		10c	F% = 41-50	1		19b	W : M = 2 : 1	1	
4d	M = 4-12.5	3		10d	F% = 51-75		3	20a	A% $\leqq$ 20		1
4e	M $\geqq$ 13		1	10e	F% $\geqq$ 76		4	20b	A% = 21-45	1	
5	FM = 0-1		2	11	Fc = 0		2	20c	A% $\geqq$ 46		1
6a	FM < M	1		12a	C′ = 0		3	21a	P $\leqq$ 3		5
6b	FM > 2M		2	12b	C′ = 1-3	3		21b	P = 3.5-4.5		1
7a	m = 0-0.5		3	13	Shading % < 20		2	21c	P $\geqq$ 5	3	
7b	m = 1-2.5	3		14	FC = 0		3	22	To : De = 2 : 1	1	
7c	m $\geqq$ 3		1	15a	FC $\leqq$ CF + C		2	23a	F− = 1-2		1

APPENDIX *(Continued)*

No.	Item	+	−
23b	F− ≧ 3		5
24a	3 or 4 repet.		2
24b	5 or more repet.		4
25	Conf., Cont., etc.		5
26	Cn, Ink, etc.		5
27a	Sex = 1-2		1
27b	Sex ≧ 3		3
28	fighting people or animal ≧ 2		1
29	caricature ≦ 3		1
30	dead, ghost, etc. ≧ 3		2
31	M ≧ 3 & Sum C ≧ 3	5	
32	M > 2(FC+CF+C)		1
33	4c(d) + 11		2
34	4c(d) + 23b		5
35	4c(d) + 25		5
36	7a + 9a + 12a + 21a + 23b		5
37	4d+10b+12b+15b	5	

A Case Illustrating the Concept of the Alpha Schizophrenic

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Our purpose is to present two Rorschach records which are separated by an interval of six years and three months in order to indicate spontaneous personality changes of a schizophrenic, and to demonstrate, on this individual, the principles of the systematic diagnostic approach which underlie the so-called alpha formula.

The alpha formula applies to patients whose capacity for energy control exceeds their capacity for energy output (8). The control is positive when the capacity for actual control over undesirable or anti-social impulses is very high; it is negative when the desire to act diminishes so much that the need for control is greatly reduced. The basic principle of the formula implies that some schizophrenics do not manifest the secondary symptoms of their mental disorders openly because they control, or have reduced, the intensity of their emotional and intellectual processes to such a degree as to produce hardly any specific and easily recognizable schizophrenic symptoms. These patients, therefore, frequently present serious problems of clinical diagnosis. However, data were presented which demonstrated that some of these patients can be accurately diagnosed on the basis of the Rorschach test. They will reveal the following Rorschach pattern: (a) few whole responses; (b) few color responses; (c) more light shading than color responses. Since color responses and whole responses reflect energy output, and light shading responses reflect energy control, Piotrowski postulated that in schizophrenics as well as in other psychotics, there is a significant disproportion between energy capacity and energy control (4). When control exceeds potential energy output the patient is called an alpha case; when control is significantly weaker than energy output, the patient is called a beta case.

One of us (D.L.) has come across a patient who had given a Rorschach which did not conform to the alpha formula but which contained distinct schizophrenic Rorschach features. In the last seven years, the patient improved clinically (staying outside of hospitals and supporting his family as well as himself) and, at the same time, his Rorschach record changed. In his recent Rorschach record, there are no longer distinct schizophrenic features but the record is now that of a typical alpha case. At the time of his last record, the patient gave a spontaneously written essay on anxiety and treatment. In this essay, he described his mental processes and his theory of the causes and effects within his mental life which took place after the manifest onset of his psychosis. The importance of this description, and the theory it contains, lies in the fact that it coincides very closely with the alpha schizophrenia theory of the patient's subjective experiences (4). It is a document of more than symptomatic significance. Recently Beck (1), using a very different Rorschach diagnostic approach, described a form of schizophrenia, S-3, which resembles alpha schizophrenia in most of its essential traits. Beck noted that these schizophrenics change little over the years which is important prognostically. Molish's (3) type B-A1 is identical with Beck's S-3 type. This author stated that the principle underlying the alpha schizophrenia concept "is of import in relation to the findings of

the B-A1 group." Thus, whatever the name by which he is called, the alpha schizophrenic is important both theoretically and practically.

The patient, a handsome, white male of French-Italian descent, the oldest of nine children, was born in a small town in the east. The father is said to have provided adequately for his large family. The patient described his mother as controlling, but fair and capable. There is no record of a disabling mental disorder in the immediate family. Birth and early development were apparently normal. Diphtheria, at the age of six, was followed by some speech defect, which is now absent. The parents became overprotective and the patient was called a "sissy" by his playmates. Although his marks were very high, the patient left school during the 11th grade because he was "too nervous to sit in school all day." From the time he left school until he entered the Army at the age of 18, he changed jobs frequently. During his military service he was confined near the arctic circle with three other men in an isolated area for several months at a time. According to Army records, he started to become moody and discouraged one month after he arrived at the arctic station. Periodic furloughs helped him over his depressions. After being stationed there for thirteen months, he was hospitalized with the following complaints: Moody, seclusive, unable to sleep, and frequent crying spells. During a brief hospitalization followed by a 21-day furlough to the States, "on one occasion, he beat his head against the wall," and "it helped him temporarily." On this furlough he married a girl he had known only about three weeks. Soon he sent her away to live with his family who disapproved of her because of her religion and because they considered her beneath them. Five months later, he was again hospitalized, this time for various somatic complaints. It was after discharge from the hospital that he was returned to the United States. During the following four months he held at least four different assignments and was hospitalized four times. His complaints consisted of depression, excessive brooding, vague somatic disturbances and suicidal thoughts. When he took an overdose of phenobarbital, an Army medical board classified this as a suicidal attempt, although the patient denied any suicidal intent. During this four-month period the patient underwent plastic surgery by a civilian physician for "lop ears." About four months after his return to the States, he was admitted to an Army hospital for the last time. He was "lying on his bunk refusing to answer questions or to undress, crying softly and clinching and unclenching his fists." The patient was "seclusive with sporadic periods in which he mixed quite well." Usually he stayed in his room, although fearful of being alone; he claimed to have no taste for food, no interest in anything. He was discharged from the Army two months later with the diagnosis of psychoneurosis, mixed type.

The patient's first admission to a Veterans Administration Hospital occurred at the age of 23, a little over two years after his discharge from the Army. He complained that for the three weeks preceding admission he had felt depressed, apathetic and extremely tired. Also he had been unable to sleep, had had difficulty concentrating on his work, and had thought obsessively about suicide. He stated that he had entered the hospital voluntarily because he was afraid that an easy opportunity to commit suicide might present itself during one of his spells of depression. However, at the time of his admission he declared he did not feel he would commit suicide. About a month before admission he had been seized suddenly with an urge to travel; he had left his family impulsively and had been absent for three and one-half days without being able to recall his whereabouts. Apparently his consciousness was clouded at the time. The police found him and

returned him to his family. He used to take long walks by himself. He dreamt every night and his dreams were odd and inexplicable to him. He reported one repeated dream in which he was falling from a great height and was then attacked by a pack of dogs. After nine days he left the hospital against medical advice. He was in excellent contact when admitted to the hospital and at no time during the nine days were there any overt signs of delusion or hallucination. He claimed that prolonged hospitalization would interfere with the fulfillment of his responsibilities toward his family. He had then one three-year-old child, and his wife was due to give birth to another. He told the social worker that he did not want to leave but "felt it my duty to be by my wife at this time and also because my mother wants me to leave here—it is hurting her too much to have me here."

Three months later the patient was re-admitted to the same hospital with essentially the same complaints but they were less acute. However, he had one additional complaint. He said he had taken to heavy drinking two or three nights a week until the early hours of the morning. He returned to the hospital because one of the psychiatrists on the hospital staff was "the only person I have had confidence in." He summed up his condition as follows: "It seems like I am just walking up a blind alley and getting nowhere in my work. And I am somewhat unhappy." The moment he entered the hospital, his tension decreased markedly. He was in good contact, pleasant and cooperative, displaying no clinical evidence of psychosis. Less than four weeks after admission, on the very day he was to be transferred to the chronic service, he escaped, leaving no message. It was during this second admission that the first Rorschach record was obtained. The patient returned to the hospital voluntarily for the third time, four months later, arriving at 3:00 a.m. He had just squandered $300 on a ten-day binge, leaving his wife and children without money. He insisted that now his major problem was alcohol. He had tried Alcoholics Anonymous with little success. The patient also started to stress his marital difficulties. He disclosed that his wife had left him every so often, taking the youngest child with her, and he described her as cold and frigid. The wife had been twice in a mental hospital. Once she had electric shock treatment. During this third admission the patient himself was diagnosed as schizophrenic by the psychiatric staff for the first time. He was discharged with maximum hospital benefit three weeks after his admission. His next admission, five months later, was almost identical with the preceding one. He arrived late at night after a spree, voiced the same complaints, adjusted well to the hospital and was discharged with maximum hospital benefit after a month. He reported having three dreams of coitus with his wife during this admission. In one of the dreams a door opened. His free association was that his parents were interfering with his marriage. Social Service established that the patient's parents, especially the mother, were taking a very active part in the patient's life. The fifth admission took place seven months later, again at the end of a drinking bout. This time, he left against medical advice six days after his admission "to help his father who was ill."

The patient was hospitalized five times during the period of about two years, but never spent more than four weeks in the hospital at any one time. This two-year period was crucial in the patient's life, and yet there were no important changes in the patient's external or environmental conditions. Then followed a five-year period during which the patient was not seen in the Veterans Administration hospital, but was admitted voluntarily to a state hospital which he left in less than two weeks with a diagnosis of alcoholism. On his most recent admission, following the five years of relative calm, the

patient explained: "I don't know what it is. I was O.K. until a month ago. I have a responsible job; I am throwing it away. I don't know what I am afraid of, what I am running away from. I can't put my finger on it. I have nightmares of being chased or followed; of guys putting their hands on me but I always wake up before they do." He had locked himself in his room on several occasions because "I have this terrible fear." Once, while slightly intoxicated, he closed himself in the bathroom and slashed his wrists. His parents reported that, when drunk, "he walks around like a zombie and expresses ideas of worthlessness." He had separated from his wife. The second Rorschach record was obtained, and the patient wrote the spontaneous essay on anxiety and its treatment during this last admission. The patient was discharged after about a month during which he showed no overt psychotic symptomatology.

Ten months following this last discharge from a Veterans Administration hospital, the patient was invited to come for a follow-up. He reported doing well. He was dressed in expensive-looking, somewhat gaudy, sport clothes and drove a late model automobile for which he said he had paid cash. He added that he had been working as an automobile salesman, making over $200 a week from the time of his discharge. He said also that he had saved much of this money and had gone into business for himself. He had remained separated from his wife, and a divorce was pending. His two sons were in a private school of his religious denomination; his daughter, the youngest child, was with his wife. He confided that he was "going with" another woman, a school teacher, and was seriously thinking of marrying her.

When asked directly how he had managed to stay out of hospitals he answered: "I haven't had a drink in six years." When drunk, he did not have the necessary caution and self-control to deal with difficulties. Now "I can live with what I have. I study my reactions before I react." We feel that these statements are characteristic of the kind of people who are termed alpha schizophrenics. The patient's Army history was gone over with him and he confirmed our information except for one incident. He insisted that the catatonic-like episode which led to his discharge from the Army had resulted from overindulgence in alcohol and other drugs ("goof balls") at a party. He expressed the belief that the Army psychiatrist had diagnosed him as mentally ill in order to prevent a court martial. According to the Army records, the psychiatrist felt he was dealing with an "early schizophrenic." This impression is in keeping with the patient's subsequent development. At the time this article is being written, the patient has not been in a mental hospital for over four years. The patient has never been in psychotherapy outside of a hospital, while the "psychotherapy" in the hospital consisted of a minimal attendance at group orientations and unscheduled meetings with the ward physician. This patient has had no psychotherapy in or outside the hospital. This is an important point because the conclusion that a rise of the alpha formula score is associated with improvement, and a drop of the score with a worsening of the schizophrenic's psychological condition was reached after a study of schizophrenics who had not received any systematic or prolonged psychotherapy (5).

The First Record

The patient was referred to psychology with the request for a diagnostic impression during his second post-service hospitalization when he was 23 years, 10 months of age. The clinical history suggested that the differential diagnosis would be between schizophrenia and psychoneurosis. Schizophrenics often struggle against their psychosis for years before they finally succumb to apathy or hallucinations. Before the manifest onset of the

RORSCHACH RECORD OF A MILD SCHIZOPHRENIC MAN OF 23 YRS. 10 M. INTELLECTUALLY SUPERIOR

No. of Resp.			Score	IntRT	Response
			I		
(1)	W	Fc'	a P	4″	Bat.
(2)	D	FM	a		Perhaps even a crab.
(3)	W	Fc	a P		Butterfly.
(4)	d	c'c	x-ray		X-Ray.

(Bat General appearance. () First of all it is black. The general outline. — (Crab) Two claws coming up. () The position of the claws on the body. The appearance, like an open hook ready to grasp. () General look, aspects, the outline. (Hook-like top center extensions, down to upper edge of two upper white spaces in the middle). — (Butterfly) The transparency in the center. The whole outline. The transparency is most important. — (X-Ray) Just the center (of right side) because of the transparency. Not any particular thing; an x-ray. () Because it's positive and negative (light and dark).

			II		
(5)	D	FC	a	23″	Again, part of a Butterfly

In the tail. () Back of the butterfly. () The outline, and the color. (Bottom red).

			III		
(6)	W	M	h P	24″	To go to extremes, it might be two men trying to pick something up; a caricature more than anything else.

() Head, neck, body, arms, legs, even shoes, eyes. Not a true picture because it's not a good outline, no good characteristics.

			IV		
(7)	W	Fc	ad P	14″	Skin of small animal.

() The texture more than the outline.

			V		
(8)	(DW	FM—	a O)	41″	Hmm! Nothing at all. Discouraging?

() Do you want the wildest figment of my imagination? () Might be a rabbit running. I see the legs flying back here (side extensions). Elongated ears. Legs also, seen from above (bottom center).

			VI		
(9)	D	F	ad	48″	An insect's head is all I can get out of that.

The outline, two eyes, "tendrils". I'm not too sure about the choice of words. (Vertical middle detail from "whiskers" up).

			VII		
(10)	W	c'c	map	33″	Map of something.

Topographical map. () The dark spots indicate the mountains. Also the lighter spots (helped to get the idea).

			VIII		
(11)	D	FM	a P	14″	Animal climbing something.

Very clear. () The outline. () Very nearly perfect. There is a little distortion in one leg. (Right side pink).

IX

(12)	DS	mC	pl O	25″	Something budding forth. Maybe the bud of a flower.

The large white portion (top center) seems to be bursting out. () The petals (orange) on the sides appear to be giving way. () The color.

X

(13)	DW	CF	astr O	21″	Reminds me of the zodiac.
(14)	W	CF	smb O		Surrealism.

(Zodiac) The crabs, the scorpion (side blues) () Again I think the color is very important. () The zodiac has green, blue, gray and brown. That is how I got it. () The color and the crab. (Means a colored picture of the zodiac); — (Surrealism) Some sort of message. Trying to put something across. () Just done at random. () The blots are perfect in appearance. () Color and symmetry are most important.

TABULATION

W	6	M	1	a	6	No. Resp.	14
DW	2	FM	3 (1—)	ad	2	R (VIII-X)	4
D	4	mC	1	h	1	Time	11′
DS	1	c′c	2	pl	1	T/R	79″
d	1	Fc′	1	Xray	1	R (VIII-X) %	29
		F	1	map	1		
		Fc	2	astr	1	IntRT (1-X)	22.9″
		FC	1	smb	1	IntRT (col)	29.4″
		CF	2			IntRT (nc)	22.5″
F+%	100						
						W : M =	8 : 1
a%	57					M : ΣC =	1 : 3½
h%	7					Σc : ΣC =	5 : 3½

disease, the patients frequently complain about disturbing dreams which keep haunting them during their waking hours (as did our patient). Obsessive and compulsive ideas usually precede all other symptoms by many years (in our case, fear of suicide and precautions against it).

Statistics based solely on the frequency of components are not helpful in diagnosis, particularly if the psychosis is one of mild degree. Rorschach provided four different sets of statistical data as alleged aids in the diagnosis of schizophrenia. A glance at Table VIII in his *Psychodiagnostics* shows that statistics for the least deviated, "well-preserved" schizophrenics do not differ from statistics for the normal group. Other investigators have had similar results with this kind of approach. Only a pathognomonic or a systematic approach can be helpful (4). The systematic approach is a form of pattern analysis.

From the diagnostic viewpoint, the most conspicuous feature of our patient's record is the failure to interpret plate V during the performance proper. Piotrowski (6, p. 425) found failure on plate V only in records of severely disturbed patients with little chance for improvement. It is a rare feature which occurs more frequently in schizophrenics than in organics, and appears very rarely in other subjects. It made us feel that the patient was a serious case. This impression was strengthened by an analysis of the patient's reaction to plate V during the inquiry: "A rabbit running. I see legs flying back here (bottom center), elongated ears (top center), legs also (sides)." It is possible to see a good rabbit in the entire vertical center of the plate, but this patient confabulated. The ears and (center) legs were his clues. However, he became unable, suddenly and unexpectedly, to isolate visually the vertical center from the

rest of the blot. Applying the "rabbit" image to the entire blot, he created a poor form response. In a perseverating answer he called all the extensions, except the top center, "legs." He realized something was wrong and called this response the "wildest figment of my imagination," but he could not (like many cases with intracranial pathology) correct his response. Such a perceptual defect is always very significant, particularly if it occurs in the record of an intelligent and obsessive patient. Psychoneurotics do not manifest such perceptanalytic confusion; psychotics do. It implies that, at times, the quality of the patient's thinking drops markedly, to the point of becoming unrealistic. From the fact that there was only one poor response of this kind in the record, we can infer that the patient manifested confused thinking only at rare intervals. E. Bleuler (2) indicated that the difference between moderate and severe "dementia" (which is not necessarily irreversible) is an extensive and not an intensive one. The mildest case of schizophrenia can commit as great a piece of folly as the most severe, but he commits it much less frequently.

The long initial reaction time and the minimal number of pure form responses are conspicuous in the record of a man whose IQ is high. (Shipley-Hartford 130, Revised Beta 117) and whose emotional responsiveness to the environment (ΣC) is not only adequate in intensity but is satisfactorily controlled (Σc:ΣC). In a patient with an IQ of over 120, one would expect more than one human movement response. Since uninhibited individuals tend to be ambiequal, i.e., have about the same number of human movement and color responses (10), it is probable that the patient's fantasy life and his conscious thoughts regarding his role in interhuman relationships have been inhibited. If so, he found his prototypal life role unacceptable. One's life-role is one of the least modifiable traits and does not change without powerful motivation (6). Since the patient was not in deep psychotherapy, we had to conclude that the personality changes were motivated by endogenic factors, among which could be an incipient schizophrenic process. A cerebral organic disease was unlikely because of the high level of imagination, the accuracy of thought at nearly all times (only one response, #8, out of 14 is very poor and was given with hesitation, during the inquiry) and the speed and ease of interpretation.

In early schizophrenics, any definite signs of psychosis are likely to appear only in conditions of emotional stress. The need to adjust to others creates a tension and stress in most schizophrenics. In the Rorschach this is likely to be manifested in plates which have chromatic colors and elicit color responses. The patient's response to plate VIII is unexpectedly meticulous: "very nearly perfect"; "little distortion in one leg." This accurate percept contrasts with the vague and uncontrolled response to plate V, "the wildest figment of imagination." Schizophrenics produce by far the greatest surprises and variations in mental production. Response #12, "something budding forth" so that sides have to give way, expresses a basic life function, a favorite preoccupation of schizophrenics. Response #13 takes us into the wide spaces of the universe, and response #14 refers to the capacity of the mind to unravel the significance of coincidences: "a message; trying to put something across" though "blots are perfect in appearance." Being original, responses #12 to 14 indicate matters of great personal importance to the patient. Thinking of the universe and then seeing a message in something done at random (which on a psychological level means: done unconsciously or achieved by powers outside the patient's control) suggests schizophrenia.

The schizophrenic signs — aside from the conspicuous drop in the level and quality of intellectual performance in plate V — were weak and therefore the psychosis would be hard-

ly conspicuous clinically. The more the tabulated components approach the expected distribution, the less is a mental disease noticeable on superficial observation. With advancing deterioration, the capacity to maintain a near-normal surface personality and near-normal social behavior decreases. This is reflected in increasing deviations of the tabulated data from the averages of the group to which the patient belongs on the basis of his age and intelligence.

The prognosis for the next three-year period was evaluated with the Piotrowski-Lewis three-year prognostic criterion (9). The patient obtained a score of plus 2 points; this suggested that, at the end of the three-year period following the taking of the Rorschach record, the patient probably would be improved somewhat or would be in about the same condition. The chances for remaining unchanged or somewhat improved were about the same: The patient displayed intellectual passivity on plate V; he did not direct his thinking critically and consciously. This sign of intellectual passivity contributed a minus one point to his criterion score. He received a score of plus one point for his single FC response, and a score of plus two points for the human content percentage which was seven. The total prognostic criterion score of plus two points is just barely above the critical point.

The most conspicuous features of the Rorschach indicate the salient traits of the personality. The range of the initial reaction times from 4 to 48 seconds, with a failure to interpret V during the performance proper, suggests a marked state of tension, consciously and fully felt. The animal percentage (too high for a bright subject), the near-absence of human content (only one h or hd), weakened in significance by referring to caricatures and not to living people, and the limited number of human movement responses, point to an impoverished inner life or fantasy. Intellectual productivity is much below its potential level. Primary thought disturbances would be expected from the handling of plate V. Intermittent depressive moods are indicated by the two dark-color responses, the butterfly in I and the map in VII. Since each c′ is given a weight of 1.5 points and each Fc′ a weight of 1 point, the Σc′ is 2.5 points which is rather high. The patient had a very strong dark shock in plate V. A dark-shock, like any shock measurable in terms of time needed to give the first scorable response, is a sign of neurotic anxiety and of an unconsciously motivated conflict. In the case of the dark-shock, a patient is ambivalent about whether or not he should become fully aware of depression which results from a realization that his personal liabilities are so great that they prevent a normal and satisfactory adjustment to, and active handling of, interpersonal and other social problems. The difference between the color shock (plate II or plate VIII shock) and the dark-shock lies in the emphasis. In every case of neurotic anxiety (which in this case would be conceived as being superimposed upon the schizophrenic psychosis) there is a mixture of inner and outer factors; the environment always plays some role in the development of the anxiety, and so do personal traits or weaknesses. However, when there is dark-shock the patient tends to blame his own personal weaknesses for his failures, while when there is color-shock, he tends to blame others, the social environment, or other objective difficulties of life (6). It can be inferred, then, that our patient would feel strongly — in view of the acuity of his dark-shock — that he has serious personal weaknesses which are responsible for his difficulties, and that he would be very ambivalent about becoming fully aware of his feelings of personal inadequacy and of his tendency to reduce the scope of his activities, a tendency which usually accompanies a depressive attitude. About a week before his Rorschach the patient expressed a fear of committing suicide if he were

not in a hospital when overcome by a severe depressed mood. Yet, after less than a month in the hospital he eloped from the place of refuge. This behavior illustrates his ambivalence clinically.

THE SECOND RECORD

The second Rorschach record was taken when the patient was 30 years old or 75 months after the first one. To the psychologist wishing to use the Rorschach as a diagnostic aid, the first record presented diagnostic problems very different from those posed by the second record. In the first record, the chief argument for psychosis was based on the failure to respond to plate V, the peculiar "message" response to plate X, the perceptual confusion about the inquiry response to plate V, and the single instance of sudden meticulousness about a small detail (plate VIII: "very nearly perfect—little distortion in one leg"). At the time of his first Rorschach examination the patient was adequately self-controlled but moments of much lowered self-control were possible because of the patient's intense anxiety. The latter was indicated by the long average initial reaction time of 23" and the great difference of 44" between the shortest and the longest IntRT. Since there were also incidental (pl. III and VIII) though classical signs of obsessiveness (the patient criticized adversely the fit between his percept and the respective blot area), we could infer that his self-control was adequate on the whole. The very inferior confabulated response to pl. V indicated the patient's thinking broke down occasionally and was unrealistic.

During the interval between the two records the patient underwent a marked personality change and became an overcontrolled case with an alpha formula score of eight points, according to the revised formula (7). The low number of whole responses, four, contributed one point, the absense of color responses, three points, and the difference between the sum of weighted light shading and sum of color responses, four points. When the formula score is higher than five, there is practically no doubt that the patient suffers from a mental illness more serious than a mere psychoneurosis. The patient could be a manic-depressive psychotic, a schizophrenic, or an organic cerebral case. With so much restraint and control, the patient was obviously not manic. He could not be said to be depressed because the speed of his responses was too rapid and too smooth. The intermissions between his responses were brief, the readiness to perform was good, and the variation in content (including such percepts as Santa Claus, insignia, royalty) was varied. The high level of intellectual performance, the accuracy of thought and perception, the ease and self-assurance with which the responses were given, and the independence with which the patient decided himself whether his responses were adequate or not, seem to rule out an organic brain disease. By elimination then, schizophrenia remained as the sole possibility.

The striking disappearance of color responses led to the conclusion that the patient had become emotionally flat and must appear withdrawn. The human movement responses did not change in number (there was only one M each time), but changed in type. In the first record, the men in pl. III cooperated in "trying to pick something up." During the second examination, the men were "quarreling, quibbling; both have hold of an object, whatever it is." The patient had become aggressively competitive and acquisitive in his basic attitude toward others and in his philosophy of life.

The drop of whole responses from 8 to 4 indicated a drop in the patient's readiness to exert himself in order to accomplish something worthwhile which would testify to his ability and bring rewards. The pattern composed of few W, no color responses, many light shading responses and high F+%, indicated good capacity for

RORSCHACH RECORD OF SAME MALE SCHIZOPHRENIC INTELLECTUALLY SUPERIOR AT AGE 30 YRS. 1 M.

No. of Resp.	Score	Response
		I
		To me it's just an ink blot.
(1)	D F ad	I see what might be a crab or a lobster.
(2)	d c'c x-ray	Might be an x-ray negative in the center part. Dark and light effect. That's it.
(3)	d F± map	Outline of geographic map, peninsula, island. That's it.
(4)	W F smb	An insignia.
(1) Claws. (3) The edge. (4) The shape. () An eagle.		
		II
		This I see very clearly.
(5)	D FMc a	An outline of a dog. Bushy forehead. Snout. Forepaws. Might be sitting up.
(6)	D F a	Bottom looks like a horseshoe crab. Outside of that I don't see a thing.
(5) Nose and ears. (6) The shape.		
		III
(7)	W M h	Here I see a caricature of two men. Seem to be quarreling, quibbing. Both have a hold of an object, whatever it is.
(7) Fighting over a package.		
		IV
(8)	DW F— ad	At a quick glance, a scotty dog.
(8) Face, ears. At a quick glance looks like a scotty's head.		
		V
(9)	D F a	This reminds me of a rabbit right away.
(10)	DW Fc'c— ad	Over-all picture of a rabbit skin roughly. The dark and the light.
(9) Ears. (10) Looks like fur before processing.		
		VI
		Do you have to look at it one way? Can you turn it? ( )
(11)	d F hd	Outline might be Santa Claus. Might be some kind of royalty.
(11) The outline – beard flowing out. Profile shows peaked crown and flowing beard.		
		VII
(12)	D c'c map	Map. Topographic. Dark and light effect.
(12) Resembles a map of some sort. Cartographic.		
		VIII
(13)	D F a	Two rodents. That's all I really get out of this one by any stretch of the imagination.
(13) Two small rodents. () Physical shape resembles animal with 4 legs.		
		IX
(14)	DS FCwpl	This reminds me of some kind of plant or flower. Petal, cabbage, cauliflower. The white in the middle would indicate a cauliflower.
(14) Just the shape. () Looks like a large bud with petals around it.		

X

(15)	D F a	Here I insult my I.Q. I see two crabs.
(16)	D F ad P	Rabbit's head.
(17)	D F a P	I see two dogs very clearly.

(15) Faintly resembles a crab.

TABULATION

				a	6	No. Resp.	17
				ad	4	R (VIII-X)	5
				h	1	Time	15
W	2	M	1	hd	1	T/R	.88′
DW	2	FMc	1	pl	1	R (VIII-X) %	29
D	9	c′c	2	x-ray	1		
DS	1	Fc′c	1 (1—)	map	2	IntRT below	10″
d	3	F	11 (1 1/3—)	smb	1		
		FCw	1			W:M=4:1	
F+%	82					M:ΣC=1:0	
a%	59					Σc:ΣC=4½:0	
h%	12						

precise routine work but one associated with avoidance of responsibility. This conclusion was strengthened by the very brief and even initial reaction times and the absence of color shock. If anything, the patient showed the opposite of color shock, for he remarked immediately, when handed plate II, that he saw everything very clearly and proceeded to interpret the plate. If this was a counter color-shock reaction, it suggested a well compensated neurotic anxiety. The way in which the patient evaluated his responses to plate II and VIII, i.e., plates which elicit color shock, implied that one of his main defenses was intellectualization. He spoke clearly, controlled his production deliberately, and evaluated the adequacy of fit of his images with the blot areas, as if to make certain that his reaction to plate II and VIII (the best measures of neurotic anxiety on the Rorschach) be controlled and not impulsive. This analysis of his own responses was one way to increase caution and decrease the danger of spontaneity. His control failed him somewhat when the patient was exposed to the darkest plates. The initial reaction times were brief but the quality of the response was poor. In plate IV, the scottie dog face was suggested to the patient by the upper half of the plate; the eyes were the dark elliptical inside small details on the level of the enclosed white spaces on the sides. The vertical center of V evoked the good rabbit response but this percept prompted him to interpret the entire blot as "a rabbit skin roughly." Since he manifested no color shock, the patient was not inclined to blame others for his difficulties.

In a brief record of 17 responses, given by an intellectually superior adult, there were three crabs, three rabbits, two maps, and two dogs. This pointed to stereotyped thinking, devoid of imagination. This lack of imagination, combined with the striking over-control, prevents gratifying achievement. Though the emotional interest in others was very limited, this man wanted prestige which meant that he was consciously interested in security. The desire for prestige was indicated by the "insignia" in plate I, the "royalty" in VI, and the remark that his I.Q. was being insulted. Since the patient did not exert himself in order to achieve anything noteworthy, his desire for recognition was likely to remain unfulfilled. Being aloof does not suffice to secure the respect of others. During the re-examination there was no dark shock; the patient had apparently lost the fear of fear,

the fear of what is new and unknown. However, the tendency to intermittent depressive moods has increased in intensity.

The patient experienced a very moderate sex shock. On plates VI and VII he avoided the central areas which frequently evoke frank sexual associations and instead, "perceived" the crowned head of a bearded king or of Santa Claus in the low side edge of pl. VI. One might speculate that the patient had erective difficulties: the out-flowing beard of the king was soft and the cauliflower bud (pl IX) grew slowly. All aspects of life, including the psychosexual one, were restrained. Even the animal movements became subdued and non-aggressive as compared with those produced in the first record. The sole FM referred to "a dog with a bushy forehead, sitting up" as if begging. One important reason for drinking, the desire to feel freer inwardly, disappeared. The FM became less expansive than the M. Presumably then, the patient would not feel freer when under the influence of alcohol (6). In the first record, the M was less active and expansive than the FM; at that time the patient drank heavily. This change in the M and FM suggested that there had been a shift in repression. The aggressiveness had become conscious: it appeared in the M. The patient was ready openly to compete with others; it was probable that the striking rise in self-control (more exactly, self-restraint) made it possible for the patient to face his aggressiveness because its overt manifestations would be well controlled. The increase in pure form responses from two to eleven (in a record of 17 responses) also points to restored inner calm; the patient did not take practically everything as a matter of great personal importance as he had done earlier. His ability for being objective, for viewing problems with a degree of detachment, had been restored. Simultaneously, the number of original responses had dropped and the number of popular responses had increased, indicating that the patient was now thinking more common and less unusual thoughts. The decreased need for conscious and deliberate self-control is reflected also in the disappearance of the emphasis on the symmetry of the blots.

During the interval between the two examinations, the patient stopped drinking heavily, had separated from his wife, and looked better than on previous examinations. The favorable three-year prognosis, based on the first record, was thus confirmed.

The Alpha formula is not applicable to every case. It is valid only when the following conditions obtain: $W < 7$ and $\Sigma c \geqq \Sigma C$. When both conditions obtain, both high and low alpha scores are admissable, i.e., we can both detect and eliminate, with the aid of the formula, conditions more serious than a mere psychoneurosis, with the expectation of being right in 85% of the cases. If only one condition obtains, only the high scores, pointing to the presence of a disease more serious than a psychoneurosis, are valid; the low scores then cannot be used to eliminate a psychosis. In this patient's first Rorschach record, only one condition ($\Sigma c \geqq \Sigma C$) obtained; therefore the low score of 0 did not allow any definite diagnostic conclusion. Both conditions obtained in the second record; moreover, the alpha score was very high, 8 points, strongly suggesting a psychosis. The patient was a schizophrenic. The change from an alpha score of 0 points to a score of 8 points, after an interval of over six years, can be interpreted as a sign of great improvement. The patient had become more steady, better controlled, and less likely to undergo a change for the worse for at least several years. The clinical improvement paralleled the changes in the alpha formula scores and was brought about with no psychotherapeutic or chemotherapeutic intervention. This improvement was maintained for at least four years after the second examination when the patient was seen for the last time.

THE PATIENT'S ESSAY

About a month after his second Rorschach examination in which he disclosed himself as an "alpha case," the patient spontaneously wrote the following essay in long-hand. For the sake of brevity, repetitions have been deleted (about one-half of the essay). Deletions are indicated by series of dots:

"What are the figmentary and real fears that lead to the condition identified by the terminology anxiety. What is the cause or causes of the decline in confidence that accompanies this hypothesis? An accumulation of undesirable traits and habits formed during one's childhood and adolescence? An unwillingness, or inability to face normal responsibilities, or make decisions, as a result of these undesirables? It would seem that indecision and irresoluteness of purpose would be closely associated with the manifestation of these fears and subsequent breakdown of confidence. The attitudes cultivated as a result of indecision, and irrational decision is certainly not conducive to mature insight into the problems facing every adult . . . The subsequent fears, real or imaginary, would seem to be a direct result of this deteriorated confidence, i.e., the fear of inability. What path then would one pursue for clarification and elimination of the undesirable personalities which perhaps are the underlying causes for the feeling of inadequacy, which further manifests itself in anxiety. Surely the understanding of one's defects and negative qualities are not a sufficient footing on which to build a new character . . . Armed with this preliminary self-knowledge, one could then take positive action on the shortcomings so disclosed. For any degree of success, the action should be associated with a profound determination for a follow through with no unrelated influence . . . This modus operandi may be coincided with an honest effort to eliminate another manifestation of anxiety; a super-abundance of self-centeredness. This presents a more difficult problem, inasmuch as one is not always fully aware of this condition in its entirety . . . It might be beneficial throughout this whole process, for one to firmly believe that he is not really ill, but merely lacking in knowledge of the reasons for his anxiety . . . It would appear to be of paramount importance for anyone attempting this metamorphosis to abstain from any indulgence in the more common forms of escapism, notably alcohol, and the narcotics. These greatly impair the powers of perspection and reason, and, of course, present new related problems. If continued use of these methods for escape from anxiety are employed, they will no longer be a secondary symptom, but illnesses in themselves, and very real ones."

"One should attempt to replace these methods for flight from reality and their resulting phantas-magoria, with more constructive means to accomplish a similar end. In this direction, one may adopt several of many outlets for a satisfactory substitute. It might be extremely wise for one to avoid all excesses in any field, including professional or business connections, and to progress on as orderly and systematic routine as possible. It would seem that perhaps the one obstacle presenting itself here would be a complete acceptance. This in turn would appear to present the additional obstacle of differentiation. How does one really know when he has accomplished acceptance following admission? Perhaps a simple approach here would be the favorable method. It is likely that merely believing one has accepted, without any further analyzing would instill the effect desired."

The essay shows that the patient knows something about modern theories of anxiety and symptoms. He says that the effects of anxiety are so disturbing that a wish develops to alleviate anxiety. He traces the real and imaginary fears to "the fear of inabil-

ity" or lack of self-confidence. The new personality relieved of intense anxiety cannot be built of negative qualities. He then considers whether insight would give relief. Insight or self-knowledge should be followed by "positive action on the shortcomings". This action should be determined, pervading and nothing should deter it. Even more difficult is the elimination of another manifestation of anxiety: "a superabundance of self-centeredness". To improve, the patient must be "always fully aware of this condition in its entirety," i.e., of the extent of his self-centeredness, or of the division between oneself and the environment. He then makes the remark that this concentration upon surrounding reality is helped if the patient believes that he is not really ill, but is "merely lacking in knowledge of the reasons for his anxiety". It would be better, he continues, if the patient knew the causes of his fears and anxiety but retained his belief in his mental health. Alcohol, narcotics and other avenues of escape through indulgence (and diminution of consciousness) make the condition only worse. These "methods for flight from reality" should be replaced "with more constructive means to accomplish a similar end". By offering his solution, the patient unwittingly gives the rational of the alpha patient behavior: "It might be extremely wise for one to avoid all excesses in any field . . . and to progress on as orderly and systematic routine as possible." The complete acceptance of the restraint involved in this psychological change is very hard, notes the patient, speaking, no doubt, from personal experience. He ends by saying that it is best just to accept the change "without any further analyzing", as if to suggest he might get worse if he had more insight into the implications of his personality change. It is probable that also other patients have described how it feels to change from a non-alpha to an alpha case, thus giving support to the theory underlying the alpha personality change concept.

References

1. Beck, S. J. *The six schizophrenias: reaction patterns in children and adults.* New York: Am. Orthopsychiat. Assoc. Mon. no. 6; 1954.

2. Bleuler, E. *Dementia praecox or the group of schizophrenias.* New York: Intern. Univ. Press; 1950. (1st ed.; 1911).

3. Molish, H. B. *Schizophrenic reaction types in a naval hospital population as evaluated by the Rorschach test.* Washington: U.S. Navy Dept.; 1956.

4. Piotrowski, Z. A. Experimental psychological diagnosis of mild forms of schizophrenia. *Rorschach Res. Exch.*, 1945, *9*, 189-200.

5. Piotrowski, Z. A. A defense attitude associated with improvement in schizophrenia and measurable with a modified Rorschach test. *J. Nerv. Ment. Disease*, 1955, *122*, 36-41.

6. Piotrowski, Z. A. *Perceptanalysis: a fundamentally reworked, expanded, and systematized Rorschach method.* New York: Macmillan Co,: 1957.

7. Piotrowski, Z. A., and Berg, D. A. Verification of the Rorschach alpha diagnostic formula for underactive schizophrenics. *Amer. J. Psychiat.*, 1955, *112*, 443-450.

8. Piotrowski, Z. A., and Lewis, N. D. C. An experimental Rorschach diagnostic aid for some forms of schizophrenia. *Amer. J. Psychiat.*, 1950, *107*, 360-366.

9. Piotrowski, Z. A. and Lewis, N. D. C. An experimental criterion for the prognostication of the status of schizophrenics after a three-year interval based on Rorschach data. In *Relation of psychological tests to psychiatry.* New York: Grune & Stratton, 1950, pp. 51-72.

10. Piotrowski, Z. A., and Schreiber, M. Rorschach perceptanalytic measurement of personality changes during and after intensive psychoanalytically oriented psychotherapy. In *Specialized techniques in psychotherapy.* New York: Basic Books, 1952, pp. 337-361.

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A Developmental Study of Sexual Functioning by Means of a Cognitive Analysis[1, 2]

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There has been widespread application in clinical practice of the psychoanalytic theory of sexual function; in contrast, there have been relatively few attempts to verify these theoretical propositions by controlled systematic research. These concepts were originally derived from the treatment of neurotics and have been confirmed largely through subsequent application in psychoanalytic therapy. It seems desirable to supplement this kind of confirmation by submitting hypotheses regarding sexual development to controlled investigation. Among the comparatively few studies in this area are those by Sears (26) and Blum (1) with humans, and those of Kortlandt (14) and Levy (17) with animals. Some of the studies listed by Sears have been in accord with psychoanalytic theory and some not, but the comparatively small number of such investigations points up the difficulty of submitting psychoanalytic views to empirical test. The aim of the present study is an indirect empirical verification of some aspects of psychoanalytic theorizing regarding stages of psychosexual development and related notions of regression and/or fixation. More precisely we are concerned with the placement of normal controls, exhibitionists, and homosexuals along an hypothesized continuum of psychosexual development.

Psychoanalytic theory postulates that sexual development progresses through stages defined in terms of a dominant body zone. These stages are designated by Freud as "oral," "anal," "phallic," and "genital" (8, p. 622). Freud summarized psychosexual development in the following manner: "... *libido-function,* as we call it — does not first spring up in its final form . . . but goes through a series of successive phases unlike one another .... The turning-point of this development is the *subordination of all the sexual component-instincts under the primacy of the genital zone* and, together with this, the enrolment of sexuality in the service of the reproductive function" (7, p. 288). The objective of genital primacy, then, is intercourse with a biologically appropriate object, and measurement of its achievement is made in terms of the degree to which the sexual aim is intercourse with an adult of the opposite sex. Deviant sexual behavior is presumed to represent fixation at or regression to a psychosexual level more primitive than the genital stage. However, a study of the literature reveals not only a surprising lack of definitive statements as to the placement of various perversions at specific stages along the psychosexual continuum, but contradictions as well. Exhibitionism has been described as a perversion in which the level of fixation is at the phallic stage (2), whereas lower level anal problems have been considered of crucial importance in homosexuality. On the other hand, the homosexual

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has been described as follows: "The homosexual is the most mature of all perverts; he can love the object" (4, p. 75). In general, perversions have been described as attempts to deal with castration anxiety (5, p. 326), but it is apparent that psychoanalysis does not present a unified viewpoint as to the level of maturity which these various resolutions represent. Because of this lack of agreement regarding the sexual deviations, the present study, rather than embodying tests of precise hypotheses, takes on an exploratory cast.

A developmental approach which differs from that which is basic to psychoanalytic theory has been the study of formal developmental principles by Werner, who states: ". . . wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (28, pp. 2-3). Werner's structural principles have been most clearly marked out in the realm of perceptual-cognitive functioning. Recently, however, certain psychoanalytic theorists, for example, Rapaport, Hartmann, Kris, and Loewenstein (24, 9, 10, 11), have interpreted psychological development, especially with regard to ego functioning, in terms which approximate Werner's fundamental structural (formal) principles. Analogously, Kortlandt has described the psychoanalytic theory of the sexual instincts in formal developmental terms:

> During ontogeny the partial instincts mature, are conditioned, and function more or less independently of each other for some time before they are integrated into larger units, and these larger units in their turn remain independent for some time until as a consequence of further maturation, they join together as components in a still higher unit of organization, and so on. This sequence justifies the recognition of developmental stages or phases in instinctive organization, viz., the oral phase, the anal-sadistic phase, the phallic phase and the genital phase, corresponding with as many hierarchical levels in the driving system of 'sexual' behavior (14, pp. 157-8).

In the present study a formal parallelism between sexual development, described above by Kortlandt, and perceptual-cognitive development, described by Werner, is assumed. This is proposed in a general sense, for we do not assume a point-to-point correspondence between the stages attained in the two spheres. Thus, we are conceptually unifying two areas, sexuality and cognition, by viewing them in terms of common structural principles of development. Since from a formal point of view, the development of perceptual-cognitive behavior is buttressed by an experimental background, such a procedure may enable us to clarify some of the inconsistencies of surface differences that obtain in psychoanalytic views of sexual development. That this is a fruitful approach to the study of sexual expression is suggested by Kruger's study (15). She confirmed the hypothesis that thoughts of becoming perverted represented a higher order of development than active perverted behavior, i.e., the former group functioned at a cognitively higher level. The perceptual-cognitive approach within a developmental orientation has been further profitably used in the study of such diverse areas as behavior under stress (18), level of social attainment (16), psychopathological expression (21), and creativity (12).

Assuming, then, a formal correspondence between sexual development and developmental level in the perceptual-cognitive sphere, it is possible to examine the question of a theoretically presumed level of sexual development by an analysis of level of perceptual-cognitive development.

In this study we shall first examine the proposition that deviant sexual behavior represents a more primitive form of sexual expression than genital primacy. To test this, we shall compare the perceptual-cognitive level of development of a psychiatrically classified group of sexual deviants (homosexuals and exhibitionists) with normal heterosexual controls. Secondly,

we shall seek to determine, by a comparative analysis of perceptual-cognitive functioning, whether the exhibitionist should be viewed as occupying a higher or lower place on the psychosexual continuum than the homosexual. From an examination of these two questions we should be able to determine the relative positions of three groupings, namely, exhibitionists, homosexuals, and married heterosexual controls, on the continuum of psychosexual development. Finally, we shall explore the question of sexual development among individuals who concurrently function on two levels of sexual expression, as is the case with married exhibitionists and married homosexuals. Further study of persons who show such variability will be made by comparing the achieved level of perceptual-cognitive maturity of married deviants with their unmarried deviant counterparts and with matched normal control cases.

METHOD

Subjects

Deviant Groups. Seventy-four male, white deviants were included in this study. Except for traffic violations and "drunkenness" charges in ten per cent of the cases, these men had no known record of arrests for offenses other than sexual perversion. In regard to position in family, educational attainment, and occupation there were no striking observations with the exception of the unmarried exhibitionists, who demonstrated marginal adjustment in their general life situation.

Sixty-three deviants were obtained through the Psychiatric Field Services of the Wisconsin Division of Corrections. From a total of about 800 cases studied since enactment of the Sex Deviate Law in 1951 the senior investigator selected for further analysis only those individuals convicted of various sexual crimes who were considered "sexually deviant" by the observing psychiatric team. Fewer than 400 cases were so described. From these, all deviants convicted on charges of exhibitionism and homosexuality[3] were screened again, and those with records of antisocial activity such as stealing, major physical disability or suspected endocrine imbalance, or a diagnosis of psychosis were excluded. Thus, the major dimension upon which the sample was selected was form of sexual expression. Many of the unmarried deviants in the final selection admitted past and present masturbatory activity. None had maintained a close, long-term relationship with a woman, and the few contacts with women which were reported were either on the basis of casual "pick-up" or characterized as friendly, but not involving sexual intimacy. Three deviants were obtained from the Milwaukee County Hospital for Mental Diseases, and eight were drawn from Worcester State Hospital files. These eleven cases were selected by the criteria described above.

The following groups comprised the deviant sample: 13 unmarried exhibitionists, 23 married exhibitionists, 23 unmarried homosexuals, and 15 married homosexuals. In the two married groups heterosexual activity co-existed with either exhibitionism or homosexuality. It must be added, however, that case histories were not always adequate, and judgments as to exclusion from or inclusion into any of the four groups sometimes had to be based on incomplete evidence.

The thirteen unmarried exhibitionists ranged in age from 18 to 53, with an average age of 26.6 years. Nine had records of previous arrests for "indecent exposure." It was difficult to collect this group of relatively pure cases because of the frequent occurrence of other forms of symptomatic behavior in such individuals.

The twenty-three married exhibitionists ranged in age from 20 to 56, with the average being 31.8 years. About sixty per cent had records of

[3] All cases of pedophilia with male children were reviewed, but it was not possible to obtain a large-enough sample for statistical study.

previous arrests for indecent exposure, the arrests dating back fifteen years in one case. Seventeen had one or more children, one other had stepchildren, and the wife of another was pregnant at the time of the offense. The unmarried and married groups exhibited themselves before females ranging in age from late childhood through adulthood, with the preponderance of victims in the adolescent group; in some cases exposure occurred on the street before a passing populace.

The twenty-three unmarried homosexuals ranged in age from 18 to 57. The average age was 29.1 years. Most of them admitted previous homosexual experience, but only four had records of legal infractions because of deviation. Mutual masturbation, oral and anal copulation, and coprolagnia were represented.

The fifteen married homosexuals ranged in age from 20 to 49, with an average age of 32.5 years. Ten had one or more children, and in two cases their wives were pregnant for the first time when the offense occurred. One-third had records of previous arrests for homosexual activity. For neither of the two homosexual groups was the partner younger than 13 years.

Control Groups. A total of 80 controls were used in the present study. Sixty were selected after a survey of all non-symptomatic married males collected over a period of years for various research projects at Worcester State Hospital. An additional twenty were tested for the present study. All controls were white, married, and, so far as could be determined, free of psychiatric symptoms. That is, none had records of antisocial activity, alcoholism, psychiatric hospitalizations, nor deviant sexual behavior. The age range was from 18 to 66, with an average age of 33 years.[4] The majority had one or more children.

[4] The average age was computed from the 63 subjects whose precise age was known.

Assessment of Perceptual-Cognitive Maturity

The Rorschach, individually administered and scored developmentally, served as the basis for assessment of perceptual-cognitive maturity (22). The designation of several factors as indices of low development is based on the following principle: "... genetically low responses are those which indicate amorphous, diffuse, or confabulatory percepts where little attention is given to part relations and to perception of contours" (28, p. 25). Thus, global, undifferentiated responses where no form determinant was elicited (Wa, Da), vague percepts (Wv, Dv), those of inadequate form level (W−, D−), contaminations, confabulations, and fabulized combinations (Index of Primitive Thought — IPT), and a composite score which included amorphous, form minus, and confabulatory responses (Inadequate-Unorganized Per Cent — IU%) were considered indicative of primitive functioning. Also included in the category of low developmental scores were responses traditionally related to immaturity in which color, shading, texture, and vista (all designated X) were the only determinants (23, pp. 42-44).

The next higher level of perceptual-cognitive development included these scores: XF, CF+C, and XF+X. XF was the score where color, shading, texture, or vista was considered more important than form, whereas CF+C included only those percepts where color was either dominant over form, or was the sole determinant. Finally, XF+X included all form-subordinate responses.

A higher level of development was reflected in those responses in which form was dominant over color (FC) and in FX, which included all percepts where form was dominant over other determinants. Also included in this general level was Fx, an index arrived at by assigning a numerical value to FX, XF, and X. Whole integrative (Wi) and detail integrative

(Di) were also at this high-intermediate level; such responses have been defined as the appropriate organization of two or more adequately perceived blot elements into a unified response, the unification occurring in one case in the whole card and in the other in a common detail. An index of Wi plus Di over a denominator of W plus D comprised another score, Adequate-Organized Per Cent (AO%). Finally, vista responses in which form was dominant (FV), which is related clinically to introspection and reflection, were also placed within this group.

From other research utilizing the genetic scoring method, two factors, in particular, have emerged which seem to reach the highest level of cognitive development, functional integrative (Fi), and human movement (M) responses. The latter is the traditional index of human movement, while the Fi score is based on an interaction between two or more conceptually independent sub-units in the presence of M, FM, and m. In the present investigation Fi and M were considered to reflect the highest level of development. More detailed information on the genetic scoring system may be found elsewhere (22).

Questions about the location of percepts were gone over with the psychologists who originally obtained the Rorschach protocols. After all Rorschachs had been scored, any problems in scoring were discussed with two psychologists well versed in the use of the genetic method.

RESULTS

The first step in the analysis involved a test for differences among the five groups (four deviant and one control) on each of the developmental indices. The chi-square median test, a non-parametric analogue of the one way analysis of variance, was chosen as appropriate for this type of data (27). Thus, for any given Rorschach index the grand median for all five groups combined was determined, and the numbers of cases from each group that were above and below this midpoint were entered in a 2 x 5 table. If the value of chi-square computed from this table was large enough to reject the hypothesis of homogeneity among the groups at the .05 level, that Rorschach factor was then further studied.

In the second phase of the study each deviant group was compared with every other deviant group and with its matched controls on that factor found to be discriminating on the chi-square test. Two individuals were selected from the 80 normal heterosexual males to correspond in age and intelligence with each deviant individual. Matching for age was done by grouping the subjects into the following ranges: 24 and below, 25-34, 35-44, and over 45 years. Matching for intelligence was accomplished by categorization of test results into "Dull," "Average," and "Superior." Intelligence measures administered to the deviants included Corsini's Immediate Test (a vocabulary), the 1916 Stanford-Binet Vocabulary, Wechsler-Bellevue I, Wechsler-Bellevue I Verbal Scale, Wechsler- Bellevue II, Wechsler Adult Intelligence Scale, and an Otis intelligence scale. For the controls, intelligence measures included the vocabularies from Wechsler-Bellevue I, Wechsler Adult Intelligence Scale, and the 1916 Stanford-Binet. It is to be noted that all the tests were either solely verbal or contained a substantial verbal section. A table of equivalents devised at Worcester State Hospital was used to establish the comparability of intellectual level obtained from these different instruments. An attempt was made, also, to match for number of Rorschach responses, and for eighty per cent of the controls the difference in number of responses from that which the deviants gave was five or less. It was not possible to match number of responses closely for the group of unmarried homosexuals, who tended to give unusually long protocols.

Adopting the .05 level of significance, Kolmogorov-Smirnov two-sample technique (27) was used to test

for differences between any two groups. Since exact values of D associated with various significance levels for small samples of unequal size are tabulated for only a few selected sample sizes, approximate critical values of D (for .05 level) were computed from the formula $D=1.36\sqrt{\frac{n_1+n_2}{n_1 n_2}}$ Although use of this formula is not recommended for sample sizes of less than, say, 30, values of D so computed are slightly larger than the exact values tabled by Massey (20), i.e., our test is "conservative."

The results obtained from the first phase of the analysis (chi-square median tests) are presented in Table I. As may be noted, overall differences among the groups obtained with respect to only one factor, namely FC. This score was further studied, using the Kolmogorov-Smirov technique, and the results of these analyses are indicated in Table II.

The proposition that deviant sexual activity is associated with a lower order of cognitive development than genital dominance was not corroborated by these data. Contrary to expectation, the combined group of deviants produced significantly more FC responses, which are associated with relatively mature perceptual-cognitive functioning, than normal controls. When the various specific groups were compared, it was further found that married homosexuals produced significantly more FC than their matched controls.

In order to derive as much information as possible from the data, it was next decided to depart from the pre-

TABLE I—Rorschach Factor Comparisons among Unmarried Homosexuals, Married Homosexuals, Unmarried Exhibitionists, Married Exhibitionists, and Normal Controls by the Chi-Square Median Test.

Rorschach Factor*	Chi-Square
Wv	2.37
Dv	3.65
Da	2.61
W—	2.35
D—	7.81
IPT	1.58
IU%	4.77
X	5.01
XF	4.58
CF+C	1.06
XF+X	3.35
Wi	1.58
Di	2.00
AO%	1.40
FC	14.65**
FX	6.02
Fx	1.46
FV	8.57
M	5.25
Fi	3.47

* One Rorschach factor not tested because of small expected frequencies.
** Significant at .05 level.

TABLE II—Kolmogorov-Smirnov D-Values for FC

Groups	Computed Value of D
Deviants vs. Controls n-74 n-80	.22*
Homosexuals vs. Exhibitionists n-38 n-36	.23
Unmarried Homosexuals vs. n-23 Unmarried Exhibitionists n-13	.32
Unmarried Exhibitionists vs. n-13 Matched Controls n-26	.27
Unmarried Homosexuals vs. n-23 Matched Controls n-46	.24
Unmarried Deviants vs. n-36 Married Deviants n-38	.12
Married Exhibitionists vs. n-23 Married Homosexuals n-15	.25
Married Exhibitionists vs. n-23 Matched Controls n-46	.20
Married Homosexuals vs. n-15 Matched Controls n-30	.47*
Married Exhibitionists vs. n-23 Unmarried Exhibitionists n-13	.23
Married Homosexuals vs. n-15 Unmarried Homosexuals n-23	.15

* Significant difference at .05 level.

determined mode of analysis described above. Thus comparisons between all pairs of groups, using the Kolmogorov-Smirnov test and the .05 level of significance, were undertaken for several of the Rorschach factors that had not been judged significantly discriminating by the overall chi-square analysis. The suggestions emerging from this less rigorous analysis may be summarized as follows: When the various Kolmogorov-Smirnov comparisons were made with respect to D−, it was discovered that unmarried deviants produced significantly more of such developmentally low responses than did married deviants (D of .33). When the various Kolmogorov-Smirnov comparisons were made with regard to other Rorschach factors, no differences were found at the .05 level of significance. However, if we had previously adopted the .10 level, we would have rejected the hypothesis of no difference between unmarried homosexuals and unmarried exhibitionists for FV and IU%. There is some evidence that unmarried homosexuals produced more FV (D of .44) and IU% (D of .46) than the unmarried exhibitionists. On the basis of the suggestive finding that unmarried homosexuals produce more FV it is proposed that they are sexually more mature than exhibitionists, but their greater production of inadequate-unorganized percepts (IU%) complicates the picture. It does seem that unmarried homosexuals have within their repertoire both more primitive and more mature responses than unmarried exhibitionists. It is also of interest to note that unmarried homosexuals produced more percepts of the inadequate-unorganized type (IU%) than their matched controls (D of .33).

Summarizing the performance of each group we note that neither exhibitionistic group differed significantly on any Rorschach factor from each other nor from their normal controls. The unmarried homosexuals were the most expressive of all the deviant groups and offered more high as well as more low level responses than the unmarried exhibitionists. The unmarried homosexuals produced more low level responses than their matched controls. The married homosexuals were significantly different from their controls on only one variable, and in the opposite direction from that which was predicted.

DISCUSSION

The results of this study did not provide sufficient information to order homosexuality, exhibitionism, and normal sexual expression to a unitary continuum of psychosexual development. It was not possible to infer from the data that the deviant groups are developmentally lower than the normal controls, nor was the evidence adequate to answer the question of the relative ordering of exhibitionists and homosexuals.

The meager and equivocal findings are perhaps undertandable in terms of certain limitations in the nature of the investigation. Thus, the assumed correspondence between levels of sexual and cognitive development may not be precise enough for level of cognitive functioning to provide an adequate index of psychosexual development. Further, the classification of subjects was probably too broad; for example, the grouping "homosexual" may obscure many subtypes, thus attenuating the results. The gross nature of the matching procedure and the insensitive mode of statistical analysis dictated by the nature of the data may also be noted in this connection.

Granting these inadequacies in the overall design, there are, however, some interesting implications deriving from the study. The deviant subjects as a group, and particularly the married homosexuals, would appear from our data to be developmentally higher than the normal controls (greater production by the former group of relatively mature FC responses). That this inference may be correct, at least for homosexuals, has been suggested by Hooker:

> . . . what is difficult to accept (for most clinicians) is that some homosexuals *may* be very ordinary individuals, indistinguishable, except in sexual pattern, from ordinary individuals who are heterosexual. Or — and I do not know whether this would be more or less difficult to accept — that some *may* be quite superior individuals, not only devoid of pathology (unless one insists that homosexuality itself is a sign of pathology) but also functioning at a superior level (13, p. 29).

On the other hand, the view that homosexuality is an indicator of grave pathology has also been expressed: " . . . it is an abnormal personality development . . . . When such homosexual behavior persists in an adult, it is then a symptom of severe emotional disorder" (3, p. 2). In this study there was minimal evidence that unmarried homosexuals were less mature than the heterosexual normals, i.e., they had a tendency to produce more primitive IU responses. Coupling this tentative inference with the apparent greater maturity of the married homosexual, it appears that the present data mirror the contradictory views found in the literature regarding the maturity level of homosexuals. Our findings, then, raise the question of the implication of marriage for the general question of developmental level of sexual perverts. Further light is thrown on this issue by noting that the married deviant subjects as a group were developmentally higher than the unmarried deviant subjects, i.e., they were characterized by fewer immature responses (D−). The suggestion is that heterosexual association, holding the question of deviation constant, is itself reflective of higher developmental functioning.

With regard to the question of the relative ordering of exhibitionism and homosexuality, the results are again inconclusive. The only information relative to this issue was found in comparing the unmarried homosexuals with the unmarried exhibitionists. Although these findings must be interpreted with extreme caution, it appears that the homosexuals give more high level responses (FV) *as well as* more low level responses (IU%). The reasonable inference may be entertained that among homosexuals a wider variation in developmental level is found than is the case with exhibitionists. This supposition seems to accord well with the discrepant views we have noted regarding the level of maturity of homosexuals. Some of the homosexuals' comments bear upon this topic; a few of the married group indicated that they sought a marriage partner because they hoped in this way to solve the problem of their homosexuality. This attempted solution, based on dissatisfaction with their mode of sexual expression, we would view as a constructive effort towards resolution, and thus indicative of relatively mature functioning. This interpretation is perhaps supported by the fact that therapy with homosexuals tends to be more successful if the individual is discontented with his way of life (25).

In general, then, we would suggest that there is a real lack of homogeneity in the broad classification "homosexual." The spectrum of behaviors subsumed under this term may encompass a variety of relationships, ranging from those in which the partner is apparently held in affectionate and tender regard to those wherein the sexual behavior represents fleeting and more obviously self-centered, primitive attachments. As regards developmental level we would speculatively place exhibitionists somewhere within the range of developmental levels characterizing homosexuals. Typically, the exhibitionist is married and for many of our subjects the first deviant episode occurred after some major change in the relationship with the wife, e.g., pregnancy. Thus, the phenomenon seems more an acute reaction to a marital crisis than the typical enduring pattern of the homosexual.

Consideration of the findings suggests that it is somewhat artificial to view a delimited deviant sexual form in isolation from the rest of the personality organization. The unmarried

exhibitionist seems to be characterized by generally immature behavior whereas the married exhibitionist appears to follow a relatively harmonious developmental pattern until the appearance of the symptom in response to marital "difficulties." The sexual behavior of the homosexual groups, both single and married, appears to reflect an early disturbance in relationships, which should be manifested by unevenness in other dimensions of behavior. Such an hypothesis may be fruitful to pursue in future research.

SUMMARY

This study attempted to verify some aspects of psychoanalytic formulations regarding stages of psychosexual development. Assuming a formal correspondence between sexual development and developmental level in the perceptual-cognitive sphere, the proposition that deviant sexual behavior is more primitive than genital primacy was tested by examination of the Rorschach performance of deviant and heterosexual subjects. This hypothesis was not corroborated. The second aim was to determine, by a comparative analysis of perceptual-cognitive functioning, whether the exhibitionist should be viewed as occupying a higher or lower place on the psychosexual continuum than the homosexual. Evidence was not adequate to answer the question of the relative ordering of exhibitionists and homosexuals, but the data did suggest that among the latter a wider variation in developmental level is found than is the case with exhibitionists. Finally, the cognitive performance of individuals who behave in both a deviant and heterosexual fashion was examined. The results indicated that marriage, independent of type of perverted sexual behavior, is associated with higher levels of perceptual-cognitive functioning. The limited findings of this study were discussed in the light of conflicting opinions found in the literature pertaining to sexual deviation.

REFERENCES

1. Blum, G. S. *Psychoanalytic theories of personality*. New York: McGraw-Hill, 1953.
2. Christoffel, H. Male genital exhibitionism. In S. Lorand & M. Balint (Eds.), *Perversions psychodynamics and therapy*. New York: Random House, 1956, Pp. 243-276.
3. Committee on Cooperation with Governmental (Federal) Agencies of the Group for the Advancement of Psychiatry. Report on homosexuality with particular emphasis on this problem in governmental agencies. Report No. 30, Jan., 1955.
4. Feldman, S. S. On homosexuality. In S. Lorand & M. Balint (Eds.), *Perversions psychodynamics and therapy*. New York: Random House, 1956, Pp. 71-96.
5. Fenichel, O. *The psychoanalytic theory of neurosis*. New York: W. W. Norton, 1945.
6. Ford, C. S., & Beach, F. A. *Patterns of sexual behavior*. New York: Harper & Bros., 1951.
7. Freud, S. *A general introduction to psychoanalysis*. New York: Liveright, 1935.
8. Freud, S. Three contributions to the theory of sex. In A. A. Brill (Ed.), *The basic writings of Sigmund Freud*. New York: Modern Library, 1938, Pp. 553-629.
9. Hartmann, H. Notes on the reality principle. In *The psychoanalytic study of the child*, Vol. 11. New York: International Univer. Press, 1956, Pp. 31-53.
10. Hartmann, H., & Kris, E. The genetic approach in psychoanalysis. In *The psychoanalytic study of the child*, Vol. 1. New York: International Univer. Press, 1945, Pp. 11-30.
11. Hartmann, H., Kris, E., & Loewenstein, R. M. Comments on the formation of psychic structure. In *The psychoanalytic study of the child*, Vol. 2. New York: International Univer. Press, 1946, Pp. 11-38.
12. Hersch, C. The cognitive functioning of the creative person: A developmental analysis by means of the Rorschach test. Unpublished doctoral dissertation, Clark Univer., 1957.
13. Hooker, Evelyn. The adjustment of the male overt homosexual. *J. proj. Tech.*, 1957, *21*, 18-31.
14. Kortlandt, A. *Aspects and prospects of the concept of instinct*. Leiden: E. J. Brill, 1955. (Reprinted from "Archives Neerlandaises De Zoologie", Tome XI).
15. Kruger, Alice K. Direct and substitute modes of tension-reduction in terms of developmental level: An experimental analysis by means of the Rorschach test. Unpublished doctoral dissertation, Clark Univer., 1954.
16. Lane, J. E. Social effectiveness and developmental level. *J. Pers.*, 1955, *23*, 274-284.
17. Levy, D. Animal psychology in its relation to psychiatry. In F. Alexander & Helen Ross (Eds.), *Dynamic psychiatry*. Chicago: Univer. of Chicago Press, 1952, Pp 483-507.
18. Lofchie, S. H. The performance of adults under distraction stress: A developmental approach. *J. Psych.*, 1955, *39*, 109-116.

19. Massey, F. J., Jr. The distribution of the maximum deviation between two-sample cumulative step functions. *Ann. Math. Statist.*, 1951, *22*, 125-128.

20. Massey, F. J., Jr. Distribution table for the deviation between two-sample cumulatives. *Ann. Math. Statist.*, 1952, *23*, 435-441.

21. Phillips, L., & Framo, J. L. Developmental theory applied to normal and psychopathological perception. *J. Pers.*, 1954, *22*, 464-474.

22. Phillips, L., Kaden, S., & Waldman, M. Rorschach indices of developmental level. *J. genet. Psychol.*, in press.

23. Phillips, L., & Smith, J. G. *Rorschach interpretation: Advanced technique.* New York: Grune & Stratton, 1953.

24. Rapaport, D. *Organization and pathology of thought.* New York: Columbia Univer. Press, 1951.

25. Rubinstein, L. H. Psychotherapeutic aspects of male homosexuality. *Brit. J. med. Psychol.*, 1958, *31*, 14-18.

26. Sears, R. R. Experimental analysis of psychoanalytic phenomena. In J. McV. Hunt (Ed.), *Personality and the behavior disorders*, Vol. 1. New York: Ronald Press, 1944, Pp. 306-332.

27. Walker, Helen M., & Lev, J. *Statistical inference.* New York: Henry Holt, 1953.

28. Werner, H. The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), *The concept of development: An issue in the study of human behavior.* Minneapolis: Univer. of Minn. Press, (Reprint of chapter.)

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BOOK REVIEWS

Sigmund Freud, *Collected papers.* New York: Basic Books, 1959. Five volumes boxed. $25.00 the set.

Too commonly, criticisms of Freudian formulations have been made by those who do not fully understand what Freud was about. Many writers have read largely in secondary sources; some have read Freud's crystallized formulations in his major books which represent only resting points in years of preparatory work and future development. Most of these major source materials provide dated images of Freudian theory or cross sections which can only erroneously be taken as *the* theory, fixed, immutable and final.

To perceive psychoanalytic theory independently of the temporal dimension is to misunderstand Freud himself and what he sought to do. It is to struggle with phantoms long ago laid to rest or to represent a complex curve with one or two coordinates. For Freud, psychoanalytic theory and practice were never presented as a completed system. His formulations were hesitant and tentative gropings toward making sense of nonsense and coherence out of heterogeneity, subject to empirical scrutiny and thoughtful modification. To comprehend Freudianism requires one to follow the vicissitudes of Freud himself, his speculations, blind alleys and backtracking, and his uncertainties as well as his convictions. As with most creative persons, his professional contributions represented continuous restless impositions of his personal strivings upon his chosen medium. Like the artist, musician, poet and scientist, Freud wrestled with external phenomena as *representations* of his own inner tensions. The tentative solution of a technical or theoretical problem was a manifestation of a stage of his own inner growth.

The most solid understanding of Freud's contribution comes with reading him ontogenetically, so to speak, following him historically as he formulates and reformulates. To grasp his theory means to see the nature and directions of his changes as well as any formulation.

The five volumes of his collected papers published originally by Hogarth Press and the Institute of Psycho- Analysis were a boon to many persons in the psychological fields for whom Freud's original writings have become essential reference material. Basic Books has now made available the first American edition, using the Hogarth plates. The editions are identical excepting for a more attractive cover and a smaller size in the American than the British edition. Translations are by Joan Riviere and Alix and James Strachey under the editorship of Ernest Jones and the aegis of the London Institute of Psycho-Analysis.

It seems needless to "review" Freud's writings at this time: these books have been reviewed and rereviewed and their contents evaluated, modified and digested into the body of psychoanalytic knowledge. Those who have the papers treasure them as a mine of trenchant clinical observation, flexible theorization, provocative inductive leaps and vigilant empirical investigation and as an impressive case study in creative thinking.

The papers provide a kind of autobiographic history of Freud's intellectual struggles, formulations and development from 1888 to 1938. They serve as a basic framework for evaluating the major "finished products" represented by his books, the thinking behind the theory and practice.

The volumes are organized as follows:

Volume 1: Early papers, etiological and diagnostic considerations, therapeutic methods, and history.

Volume 2: Clinical papers and techniques of psychoanalysis.

Volume 3: Case histories such as the classic cases of Dora, Hans and Schreber.

Volume 4: The most valued contributions are the eight studies in metapsychology which describe the essences of the theory of psychoanalysis as a system of psychology. In addition there are 14 papers dealing with broader isses such as characterology, love, esthetics, object choice and war.

Volume 5: The miscellany ranges over the wide field of knowledge which Freud considered his ambit, brief case notes, fragments of his musings, elaborations of technical and theoretical points, clarification of newly perceived clinical observations and literary speculations.

Although it should be unnecessary to mention, these volumes belong, dog-eared, on the shelves or desks of every serious clinician and student of human behavior.

BERTRAM R. FORER
Executive Editor,
Journal of Projective Techniques

Holt, Robert R. and Luborsky, Lester, with the collaboration of William R. Morrow, David Rapaport, & Sibylle K. Escalona.

Personality Patterns of Psychiatrists. (Menninger Clinic Monograph Series, No. 13.) Vol. I: *A study of methods for selecting residents.* New York: Basic Books, 1958. Pp. xiv+386. $7.50. Vol. II: *Supplementary and supporting data.* Topeka, Kan.: Menninger Foundation, 1958. Pp. xiv+400. $4.00.

The cost of training one psychiatrist comes high, perhaps as high as $30,000. There is no way of telling the cost to society of choosing the wrong man for psychiatric training. Yet, psychiatric training centers have generally relied on fairly crude, relatively untested selection criteria, partly because demand exceeded supply of applicants, but partly, too, because so little was really known about the accurate prediction of psychiatric competence. The purpose of this book is to put the selection of psychiatric residents on a sounder basis. Robert R. Holt, now Professor of Psychology at New York University and Director of the NYU Research Center for Mental Health, was formerly Director of the Psychological Staff at the Menninger Foundation. Lester Luborsky, a psychoanalyst, is Senior Psychologist in the Research Department of the Menninger Foundation. The research on which this book is based was carried out while both men and their collaborators were all at the world's largest psychiatric training center, The Menninger School of Psychiatry.

After appropriately lengthy worry over the criterion problem, it was decided that the major criteria would be based on supervisors' evaluations of overall competence, and competence in the more specific areas of psychotherapy, diagnosis, patient management, and administration. These, and over a dozen minor criteria were shown on factor analysis to yield just one major factor: essentially, overall competence.

Three major studies were carried out. The first, with an N of over 200, was designed to assess the effectiveness of the selection procedure actually in use at the Menninger School. While the final decision to accept or reject a candidate was made by the Admissions Committee, each candidate was assessed by several (usually three) psychiatric interviewers and by means of a psychological test battery. It was found that the pooled ratings of three interviewers predicted overall competence about as well (or poorly) as did the psychologist's ratings (r about .25). The Admissions Committee, as a whole, fared somewhat better, partly because they had more data and partly because they were in a better position to weight properly the various clinicians' evaluations.

The second major study was based on a small sample (N of over 30) of highly-rated, medium-rated and low-rated residents. The purpose of this study was to develop a battery of predictors which would differentiate better from poorer residents. The methods showing some promise as differentiators included: analysis of application materials (credentials), the structured interview, TAT, TAT self-interpretation, Rorschach, Picture Reaction Test (unpublished), Wechsler Form I, and Word Association. For most of these methods complex manuals were developed to guide the judges toward more reliable predictions.

The third study (with an N of about 65) was a cross-validation of the promising predictors gleaned from the small sample study. In order to learn more about the optimal type and number of methods in a predictive battery, and to check the effect of different orders of presentation of data, a quasi-latinized design was used. Each of the four predictive judges began with a different method, made predictive ratings based on that method, then went on to the next method, made predictions based on both the first and second methods, etc. Unfortunately, only two of the judges made predictive ratings based on all of the methods. Because there were more methods than judges, the design was in other ways incompletely balanced. Within the limitations of number of judges and money available it might have been more valuable to have used fewer of the instruments but so balanced among judges that more useful conclusions might have been drawn. After the large investment of time and funds in the enormous task of gathering criterion data and selecting predictive instruments, it seems reasonable to hope that time and funds may become available to permit an extension of this study. Ideally, enough experienced, cooperating clinicians could be found to have each use all methods but in different sequences. More reliable answers would then be available to such questions as: what method or battery is best, what number or sequence is best in the prediction of psychiatric competence.

All we can say for the *clinical* predictions is that one of the two predictive judges using all of the data available to him was able to improve prediction over the pre-research level while the other was not. Nevertheless some very promising leads emerge. The most inter-

esting and least expected was the finding that a judge's rating of how well he liked a resident (a rating introduced to check on halo effect) predicted competence better than almost anything else. The Wechsler Verbal I.Q. predicted ($r = .39$) competence better than did the School's regular testers using a test battery. Because of the highly selected nature of psychiatric residents, all of the correlations are naturally lowered. An example of this can be seen here, where the above r of .39 becomes .75 when corrected for restriction of range by one of the Pearson formulae. Another valuable finding was that properly interpreted application materials (credentials) could yield predictions more accurate than those based on three psychiatric interviews, a far more expensive method of assessment. Surely, the technique of credentials analysis deserves further study because of its implications for the selection of students, internes, staff and faculty in psychology and other professions. Some of the other methods, notably the Rorschach, did not prove very useful in predicting psychiatric competence.

A particularly fruitful part of the book is the detailed discussion of sources of errors in the prediction process. Being overimpressed by superficial warmth, attractiveness and poise is pointed out as a common reason for overestimating candidates. Underestimating candidates was risked in the use of projective techniques. These tended to point up problem areas without suggesting how the problems and conflicts uncovered might manifest themselves. With the clinician's undue emphasis on pathology, residents tended to be too often diagnosed as "sicker" than they actually were.

A bonus study included is a survey of expert opinion of personality requisites of psychiatrists, which might be equally applicable to psychoanalysts and other psychotherapists. From their cross-validation data, the authors were able to shed considerable light on what personality characteristics are associated with highly-rated or low-rated residents. In general, the expert opinions given on the basis of experience were corroborated by the research data. There was enough disagreement however so that further research was deemed necessary.

Based on their research findings, their clinical experience, and specifically, their experience as members of the Menninger Admissions Committee, the authors come up with a set of practical recommendations on how to select psychiatric residents and how to do research in this field, that are probably the most valuable of any available. These recommendations may be as helpful to other mental health professions as they will be to psychiatrists.

Volume I contains enough details of design and results so that Volume II is optional. The latter is a volume of appendices which round out some of the discussions and present data in greater detail. The serious student will want this volume as well. In appearance, Volume I is attractive while Volume II, lithoprinted and paperbound, fares less well. It suffers from typographical errors over and above those listed in a full page of errata provided by the printer. In Volume I, p. 155, we are referred to Volume II, Appendix 10.9 which is nowhere to be found. Volume II, p. 208, refers us to Table 12.2 which also is absent (apparently Table 12.4 was intended). Other typographical errors occur on pages 107, 231, 232, 234, 270, 286, and 328.

While the proofreading was casual, the scholarship was not. The book rests solidly on the actuarial tradition of prediction as well as on the clinical. The more *actuarial* research in predicting academic, marital, parole, and vocational success is well reviewed, as is the more *clinical* prediction research, in the tradition of Murray's work at Harvard, the OSS work, and Kelly and Fiske's study of clinical psychologists. The question of clinical *vs.* statistical prediction, on which Holt has recently written elsewhere, is raised again. Predictably, this issue has still not been laid to its well-deserved rest.

Well-written, often fascinating, there are nevertheless some exasperating moments for the reader as when research designs change, Ns fluctuate, and excellent intentions become part of the paving of that well-known road. Most of the changes in design were essential; it was usually a case of compromise the design or scotch the project. The reviewer, for one, is glad the design was compromised.

This book should be of special interest to workers in the mental health field. Prediction researchers and those practically concerned with the selection and training of clinical students and staff will find this book invaluable. To the graduate student in clinical psychology (with his all too-frequent disdain for research) this book may have a special value. It may help him to learn that research need not be dull nor mechanical, that knowing something of research methods and statistics need not detract from his clinical acumen, and perhaps, most important, he may learn what Edward Tolman has been saying for a long time: that research is fun and has "absolutely no dull moments".

It is no small tribute to this book that from it dozens of research projects suggest them-

selves. It should be interesting to wait a decade or so and compare the data available on those psychiatrists who have since become eminent against those who have not (a sort of psychiatric counterpart to Ken Clark's *America's Psychologists*). Also, knowing now how psychiatrists do on various projective and non-projective assessment methods, what do other medical specialists do? How are they different from psychiatrists? Are the characteristics associated with competence different for the various medical specialties? But that indeed would be another book!

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GENERAL NEWSLETTER

Hofstatter, Peter R. & Lubbert, H. Die Eindrucksqualitaeten von Farben. *Zeitschr. f. diagnost. Psychol.,* 1958, *6,* 211-227.

A reappraisal of the dimensionality of color-perception as manifested in the Color Pyramid Test.

Lienert, G. A. & Matthaei, F. K. Die Konkordanz von Rorschach-Ratings. *Zeitschr. f. diagnost. Psychol.,* 1958, *6,* 228-241.

A study of inter-rater agreement in ratings of intelligence, emotionally, and social adaptation as seen in the Rorschach.

Newman, R. E. Personality development in a primitive "adolescent" group. *Zeitschr. f. diagnost. Psychol.,* 1958, *6,* 241-253.

The stress and rebellion characteristic of American and European adolescents are absent among the Otomi Indians of Mexico when the Rorschach is used as the criterion.

Bambaren Vigil, Carlos. La prueba de la "Gestalt", de Bender, en esquizofrenicos. *Revista de Psicologia general y aplicada,* 1958, *13,* 481-509.

Sample of 100 schizophrenic adults and 100 controls are compared on the Bender-Gestalt by means of Pascal and Suttell's method.

Figuerido Torija, C. A. and Figuerido Santurtun, J. A. El test de Szondi en el estudio de la impotencia neurotica. *Revista de Psicologia general y aplicada,* 1958, *13,* 523-534.

Case studies of impotence by means of the Szondi.

Ellenberger, Henry. La vida y la obra de Hermann Rorschach. *Revista de Psicologia general y aplicada,* 1958, *13,* 561-615.

Biographical sketch of Rorschach with a discussion of his works.

Dalma, Juan. Utilidad y posibilidad de un censo psiquico integral de la poblacion. Su importancia en las investigaciones de salud mental. *Archivos de Criminologia, Neuro-psiquiatria y Disciplinas conexas,* 1958, *6,* 553-570.

The author presents a proposal for investigating the psychological adjustment of his country through a sampling procedure and the use of the Kent E.G.Y., the Porteus mazes and Mira's Myokinetic method.

de Zeeuw, J. *Colour preference in psychodiagnosis.* The Hague: Staatsdrukkerij-en Uitgeverijbedrijf, 1957.

The author summarizes the literature on the psychodiagnostic implications of color preferences, develops a test and provides a good deal of normative material. The findings are presented in both a book printed by the above publishing house and a brief monograph which summarizes his work.

Chiari, Silvano. Percezioni globali e contenuti su protocolli Rorschach di fanciulli. *Rassegna di Psicologia generale e clinica,* 1957, *2,* 150-173.

A normative study of the content of Rorschach W responses in children.

Biondi, Luigi. Studio dello psicogramma Rorschach di fanciulli epilettici con accentuate turbe comportamentali nel senso dell'instabilita-aggressivita. *Rassegna di Psicologia generale e clinica,* 1957, *2,* 174-197.

A statistical and case study of the Rorschachs of epileptics.

Zecca, Graziella. Il fenomeno della perseverazione nel Rorschach infantile. *Archivio di Psicologia Neurologia e Psichiatria,* 1957, *18,* 27-38.

A theoretical and case-oriented consideration of developmental forms of perseveration on the Rorschach.

Zecca, Graziella. Alcuni aspetti della risposte di colore nel Rorschach infantile. *Archivio di Psicologia Neurologia e Psichiatria,* 1957, *18,* 1-18.

A theoretical and clinical consideration of kinds and meanings of color usage in children's Rorschachs.

Zecca, Graziella. Alcuni aspetti della risposte di chiaroscuro nel Rorschach

infantile. *Rassegna di Psicologia generale e clinica,* 1957, *2,* 198-207.

A theoretical discussion of the significance of shading responses in children's Rorschachs.

Ramachandra Rao, S. & Ramadevi, T. Situational analysis of T A T responses. *J. All-India Inst. mental Health,* 1958, *1,* 18-25.

A set of T A T pictures designed for an Indian population was used to explore the applicability of Lewin's topological psychology to analysis of T A T stories.

Pareek, Udai. Studying cultural differences in personality development with the help of Rosenzweig P-F Study. *J. All-India Inst. mental Health,* 1958, *1,* 113-123.

Differences in Rosenzweig P-F performances among Indian, Japanese and American children are described.

ANNOUNCEMENTS

WORKSHOPS

ANNUAL WORKSHOP IN PROJECTIVE DRAWINGS

The 1959 Annual Workshop in Projective Drawings, to include H-T-P, Draw-A-Person, Draw-A-Family, the Unpleasant Concept Test, Draw-An-Animal, the Eight Card Re-Drawing Test, and doodles, will be conducted at the New York State Psychiatric Institute, New York City, this year by Emanuel F. Hammer, Ph.D. and Selma Landisberg, MA., on July 27-30, from 9:30 A.M.-12 P.M. and 1:30-3 P.M. daily.

The workshop will provide a grounding in fundamentals, and then go on to advanced considerations of differential diagnosis, psycho-dynamic appraisal, psychological resources as treatment potentials, and the application of drawings in therapy. The text, *The Clinical Application of Projective Drawings*, Charles Thomas, Publisher, Springfield, Illinois, is suggested as preparation for the workshop.

For information as to admission or requirements, write to: Miss Selma Landisberg, 116 East 35th St., N.Y. 16, N.Y.

A Workshop in Projective Methods for the Study of Personality is scheduled this summer, June 22-August 6, at The New School for Social Research in New York City under the direction of Florence R. Miale and Camilla Kemple. Two courses meeting daily except Friday will offer introductory and advanced work in the Rorschach method. Classes meet from 6:20 to 8:10 P.M. and graduate credit is granted through the Graduate Faculty of The New School.

The introductory course will be given from June 22-July 14; the advanced course begins July 15 and runs through August 6. Registration opens June 15 and runs through June 25.

Inquiries may be addressed to the Department of Psychology, Graduate Faculty, The New School for Social Research, 66 West 12th Street, New York 11, N.Y.

PRESS RELEASE

"The Management of Transference" is the topic of the next professional meeting of the Council of Psychoanalytic Psychotherapists, Inc. In keeping with the Council's philosophy, the topic will be discussed by speakers from different schools of psychoanalysis.

Following an opening statement prepared by the Program Committee on "Manifestations of Transference", Mr. Milton Kapit will present the point of view of classical Freudian analysis, Ivan Wentworth-Rohr, Ph.D., will present the approach of the cultural-interpersonal school, and Helene Papanek, M.D., will discuss the Adlerian viewpoint. Discussion by the audience will follow, led by Rudolph Wittenberg, MSS, Chairman of the Program Committee.

The meeting will be held on Saturday, June 13, 1959 at the Carnegie Endowment for International Peace, United Nations Plaza at 46th Street, New York City, and will be followed by a Dutch treat cocktail party. All people in the field of psychoanalysis and psychotherapy are invited to attend.

Dr. Arthur Burton has a 700-item bibliography on psychotherapy called *A selected Bibliography of the Technique of Psychoanalysis and Individual Psychotherapy: 1952-57* available to interested Society members in limited quantities. The mailing cost is 25c. The bibliography includes appropriate foreign language references for the period covered, and classifies items on a child-adult dichotomy as well as by year of publication. It is intended for students of psychoanalysis and psychotherapy. It can be obtained by writing to him at 207 Porter Building. San Jose, California.

The International Committee has requested that authors of articles published in the Journal of Projective Techniques be invited to donate reprints to the circulating library of the International Council of Women Psychologists, in care of Dr. Dorothea Ewers, 745 Aberdeen Drive, Crete, Illinois. The Council will cite each reprint in its newsletter, which is distributed to members in thirty-six countries.

BOOKS AVAILABLE FOR REVIEW

The following books are available for review. If you wish to volunteer, please write to Bertram R. Forer, Ph.D., 2170 Live Oak Dr., East, Los Angeles 28.

Bellak, L., Ostow, M. Pumpian-Mindlin, E.

Stanton, A. H., and Szasz, T. S. *Conceptual and methodological problems in psychoanalysis.*

Caligor, Leopold. *A new approach to figure drawing. (The Eight Card Redrawing Test).*

Delay, J., Pichot, P., Lemperiere, T., and Perse, J. *The Rorschach and the epileptic personality.*

Harrower, Molly. *Personality change and development.*

Bass, B. M. and Berg, I. A. *Objective approaches to personality assessment.*

Helman, Zena. *Rorschach et electroencephalogramme chez l'enfant epileptique.*

Hess, R. D. and Handel, G. *Family worlds: a psychosocial approach to family life. (TAT and sentence completion methods).*

Magnusson, D. *A study of ratings based on T A T.*

Orr, Mirian. *Le test de Rorschach et l'imago maternelle.*

Szondi, L., Moser, U., Webb, M. W. *The Szondi Test.*

Tompkins, S. S. and Miner, J. B. *Picture Arrangement Test interpretation.*